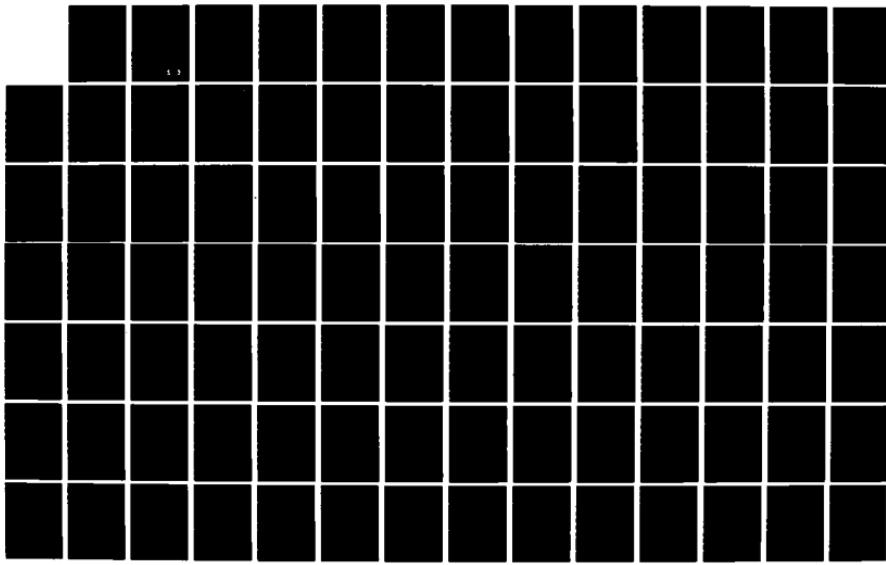


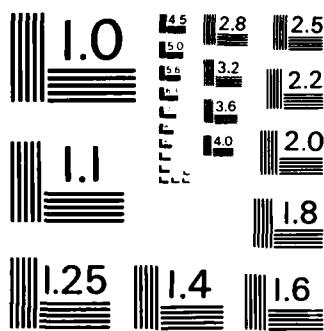
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THE OPTICAL SPECTRA OF AEROSOLS
Final Technical Report

by

F. Borghese

February 1985

United States Army
EUROPEAN RESEARCH OFFICE OF THE U.S. ARMY
London England

CONTRACT NUMBER DAJA37-81-C-0895

Contractor: F.Borghese

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The macroscopic optical constants of an aerosol of model nonspherical particles are calculated. The effect of chemical reactions on the spectra of the aerosols are taken into account. The computer programs necessary to perform the above mentioned calculations are listed and an user's guide is supplied.			

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Introduction

In this Report we describe the work done by the principal investigator (Prof. F.Borghese) and his collaborators (Prof. P.Denti, Prof. G.Toscano and Dr R.Saija) under contract DAJA37-81-C-0895 from October 1981 to November 1984. The whole research has been performed in strict collaboration with Dr O. I. Sindoni, CRDC, Aberdeen P.G., 21010 Md., USA.

In Part A we connect the work done in the years 1979-1981 under Grant DAERO78-G-106, to the work done in the last three years under the present Contract. The work itself is actually described in the papers thus far published or accepted for publication. A brief account of the problems met in the course of the work as well as a suggestion of possible solutions and sketch of the lines of future progress are also included.

In Part B is described the work done by F.Borghese, P.Denti and R.Saija during their stay at CRDC from August 18th to September 23rd, 1984 under Contract Modification P0004. Essentially the work consists of two modifications of the computer programs for the scattering properties of clusters. The purpose of these modifications is twofold: on one hand they allow the treatment of relatively large clusters; on the other hand they constitute the basis for the calculations of the properties of scatterers in which resonances occur. A description of the programs as well as a guide to the input and output quantities is included.

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PART A

In the years from 1979 to 1981, working under Grant DAER078-G-106, we devised a model scatterer suitable to approximate the electromagnetic scattering properties of non-spherical particles. By inspiring to the well known stick-and-ball model of a molecule, we approximate a non-spherical particle as a cluster of spheres. The computation of the scattering properties of such an object do not require a big effort, thank to an addition theorem for vector Helmholtz harmonics (1) formulated by the present authors. As a consequence several calculations on clusters of various geometries proved the model to be computationally sound and able to account for the lack of overall spherical symmetry of some kind of non-spherical particles. A detailed account of the model as well as the use of the Group Theory to reduce the size of the computations is contained in the Final Report to Grant DAER078-G-106, October 1981, as well as in a number of published papers (2-4).

In the years from 1981 to 1984, i.e. under the present Contract, we were able to take full advantage of the peculiarities of the cluster model in order to connect the scattering properties of individual clusters to the macroscopic optical properties of a dispersion of clusters of random orientation⁽⁵⁾. Furthermore, the flexibility of the cluster model allows the calculation of the changes in the macroscopic optical constants of an aerosol, when the clusters change their shape or when more clusters combine together to give scattering objects of different structure. The calculations show that these changes of shape produce quite detectable variations in the

absorption coefficient of the dispersion⁽⁶⁾.

These results have been recently presented at the 1st Joint International Conference on Aerosol Research, held in Minneapolis, MN, from September 17th to 21st^(6,7). In particular it has been emphasized the rather striking result that for a cluster of given structure and size parameter there exist a wavelength at which it behaves as a spherical particle. This conclusion is confirmed by a number of experimental findings of which we were informed during discussions on the subject.

We want to stress that the approach we used to connect the individual to the collective optical properties is rather elementary as it neglects the effects of multiple scattering among different clusters. As a consequence, our approach is applicable only to low-density dispersions such as atmospheric aerosols but it is unlikely to give reliable results when applied to dense dispersions such as e.g. smokes. We plan to overcome these difficulties by investigating the subject along three lines. First of all we plan to include the statistic of the particles into our formalism, so as to account, on the average, for the effect of multiple scattering and thus make the theory applicable to dispersions of relatively high density. Second, we are going to study the size distribution effect, for it has been shown that the occurrence of some size distributions can affect drastically the macroscopic optical properties of the dispersion.

Third, we will attempt to adapt our theory to the framework of the effective medium theories in order to calculate the effective dielectric constant of the dispersion. We got this idea at the Annual Meeting of Spectroscopy Group of the Gruppo Nazio-

nale di Struttura della Materia held in Alghero, Sardinia,
where the problem of small clusters has been thoroughly discussed.

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The references with an asterisk were published under Grant DAERO-78-G-106 and they are cited for the commodity of the reader.

PART B

This part of the present Report is meant to be a user's guide to our programs for the scattering properties of clusters. Before we go into the description, however, we want to explain why we felt necessary to write two further versions of the programs we used in the past.

Our treatment of the scattering from clusters is based on a multicentered expansions of the scattered field in terms of spherical multipoles. For convergence reasons, as explained in the included literature, this expansion must be carried up to a certain order L_M which, depending on the structure and on the size parameters may be as high as 4 or 5. Now for a given L_M one has to calculate, and invert, matrices with complex elements of order $d_M = 2NL_M(L_M+2)$, N being the number of the spheres in the cluster. Therefore, due to the storage limitations on the computer presently available in Messina, and at CRDC too, it is impossible to handle clusters of more than 5 spheres with $L_M = 5$. This is the maximum order that can be handled by the program PRG1 with a core allowance of 4 Mbytes. This limitation has been overcome by rewriting the program without requiring the storage of the intermediate matrices but requiring the storage of two vectors one for the spherical harmonics and another for the Clebsch-Gordan coefficients. This version of the program named here PRG2, allows us to handle relatively big clusters at the cost of multiplying the CPU time by a factor of 4. A second version of the program, here PRG3, do not require either the storage of the vector C-G coefficients, thus allowing us to handle even bigger

ster but multiplying the CPU time by a factor of 6 or 7. The capability of the three programs when a core storage of 4 Mbytes is allowed are summarized in Table 1.

As can be seen the biggest cluster can be treated only at the cost of neglecting the interactions of order higher than dipole-dipole. In any case this interaction is just that that is commonly included in the calculations of other workers. On the other hand our programs allows us to get information of value on the properties of clusters including as much as 70 spheres. Furthermore these programs allow to treat with great precision the case in which resonances occur, a case in which the multipolar interactions must be included as high to an order as possible.

The formulation and testing of these programs is essentially the work done by F.Borghese, P.Denti and R.Saija during their stay at the CRDC under contract modification P0004.

PRG1

This is the original version of our scattering programs and, as listed, it can handle a cluster of 3 spheres with $L_M=4$. The maximum capability of PRG1 is a cluster of 5 spheres with $L_M=4$. In this case the dimensions of the various matrices and vectors must be carefully checked.

INPUT DESCRIPTION

Refer to DATASET H2OTEST001.

CARD 1 (3A4)

I DATA J DATA K DATA } These quantities identify the DATASET. They can be left blank if desired.

CARD 2 blank

CARD 3 (4I2)

JGO JWMA IWCSS IWCI P } These quantities control the input and output operations of PRG1. Their exact meaning is explained in the comment cards within the programs. Note that if JGO is put equal to 1 for all the groups of data the program runs properly but for that it recomputes matrices whose elements have still valid values.

CARD 4 (5I2)

NSPH Number of the spheres in the cluster.

LMPO L_M+1

IHELP Helicity of the incident wave. Use +1 for right helicity, and -1 for left helicity.

IEXP This quantity was originally introduced to control the convergency of the multipolar expansions.
Set it to 0.

MAXIT Number of iterations. To be used only when the inverse to the matrix (15) of ref.(2) is to be calculated iteratively.

CARD 5 (3E20.8) (NSPH cards)

RXX(1) }
RYY(1) }
RZZ(1) } Cartesian coordinates of the centres of the I-th sphere
 are in the cluster.

CARD 6 (4012)

I0G(1) This index specifies the type of the I-th sphere in
 the cluster. If I0G(I+1)=I0G(I) the program does not
 recalculate the T-matrices for the I+1-th sphere
 but take them identical to those of the I-th sphere.

CARD 7 (3E20.8)

R0S(1) Radius of the I-th sphere.

CARD 8 (2E20.8)

CRI(1) Complex refractive index of the I-th sphere.

CARD 9 (E20.8,2F10.4)

VK Magnitude of the wavevector of the incident wave.
THK }
PHK } Polar angles (in degrees) of the incident wavevector.

CARD 10 (3I5)

INVER 0 the T-matrix of the cluster is inverted iteratively.
 1 the T-matrix is inverted by LU factorization.

MODE 0, 1, 2, 3. This parameter provides the equilibration
 of the T-matrix in four different modes. The value MODE
 =3 has proved to be the most suitable for dielectric
 clusters far from resonance.

NDEMST Maximum dimension of the T-matrix. It must be identical
 to the dimension of the matrix AM.

CARD 11 (2E20.8)

C1 Mixing factor for the iterative inversion of the T-ma-
 trix. The value C1=0.5 ensures good convergence.

TOL Tolerance of the inverted T-matrix. In practice $T^*T^{-1} \leq TOL$.

These quantities need be specified only when INVER=0

CARD 12 (40A4)

NAME Identifies the output. It can include any alphabetic character.

PROGRAM SIZE = 3072 BYTES, PROGRAM NAME = SMAT

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4. DIAGNOSTICS GENERATED.

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DATE 1984 NOV 07 TIME 17:30:30
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 SUBROUTINE CROSSE
 1(LMP, S, K, IHELP,
 2SECSEC, ABSSEC, TCISEL)
 IMPLICIT REAL*8(A-H,C-Z)
 COMMON//DUMS// RXX(4), RYY(4), RZZ(4),
 1RUS(4), LRI(4), XIL(4),
 2XIL(4), RXY(3,4), DMI(3,4), TSAS(2,2), SAC(2,2),
 3A(15,2), AI(120), AF(120), AMMO(15), AFMC(15), S(15), NAME(40), IUG(4),
 4GMMIN/0J14/GIM(64,16), GL4(64,16), GIP(64,16), GLP(64,16)
 CLIMPLEX*16 GIP, GLP, AI, AF, n, AMMO, AEMO, AM, AE, GI, GL, SUMM, SUME,
 1LRI, XIL, XIL, RM, SM, S, GIM, GLM, CCCN, UFDET, TSAS, SAC
 DATA PI4/ 3.1415926535897932384626433832795028841971693993751058209749445923881609540829257121210088776931945581407431764033814775053160268485151369226438918158483527743143716997218487345542427210268026122438328239110785193519773563174356/
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 NL4M=NL4-1
 NV=NLM*NM
 NM=M*N.M
 CC=.5/(VK*VK)
 CC=-(.01*CC, 1.0001)*(.5*CC/VK)
 IF (IHELP.LT.-1) GO TO 10
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 NM=M
 NV=N.M
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 12 DO 13 K=1,M
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 291 DO 292 J70=1,M.V
 292 DO 293 K70=1,M.V
 293 DO 294 L70=1,M.V
 294 DO 295 I71=1,N.V
 295 DO 296 J71=1,M.V
 296 DO 297 K71=1,M.V
 297 DO 298 L71=1,M.V
 298 DO 299 I72=1,N.V
 299 DO 300 J72=1,M.V
 300 DO 301 K72=1,M.V
 301 DO 302 L72=1,M.V
 302 DO 303 I73=1,N.V
 303 DO 304 J73=1,M.V
 304 DO 305 K73=1,M.V
 305 DO 306 L73=1,M.V
 306 DO 307 I74=1,N.V
 307 DO 308 J74=1,M.V
 308 DO 309 K74=1,M.V
 309 DO 310 L74=1,M.V
 310 DO 311 I75=1,N.V
 311 DO 312 J75=1,M.V
 312 DO 313 K75=1,M.V
 313 DO 314 L75=1,M.V
 314 DO 315 I76=1,N.V
 315 DO 316 J76=1,M.V
 316 DO 317 K76=1,M.V
 317 DO 318 L76=1,M.V
 318 DO 319 I77=1,N.V
 319 DO 320 J77=1,M.V
 320 DO 321 K77=1,M.V
 321 DO 322 L77=1,M.V
 322 DO 323 I78=1,N.V
 323 DO 324 J78=1,M.V
 324 DO 325 K78=1,M.V
 325 DO 326 L78=1,M.V
 326 DO 327 I79=1,N.V
 327 DO 328 J79=1,M.V
 328 DO 329 K79=1,M.V
 329 DO 330 L79=1,M.V
 330 DO 331 I80=1,N.V
 331 DO 332 J80=1,M.V
 332 DO 333 K80=1,M.V
 333 DO 334 L80=1,M.V
 334 DO 335 I81=1,N.V
 335 DO 336 J81=1,M.V
 336 DO 337 K81=1,M.V
 337 DO 338 L81=1,M.V
 338 DO 339 I82=1,N.V
 339 DO 340 J82=1,M.V
 340 DO 341 K82=1,M.V
 341 DO 342 L82=1,M.V
 342 DO 343 I83=1,N.V
 343 DO 344 J83=1,M.V
 344 DO 345 K83=1,M.V
 345 DO 346 L83=1,M.V
 346 DO 347 I84=1,N.V
 347 DO 348 J84=1,M.V
 348 DO 349 K84=1,M.V
 349 DO 350 L84=1,M.V
 350 DO 351 I85=1,N.V
 351 DO 352 J85=1,M.V
 352 DO 353 K85=1,M.V
 353 DO 354 L85=1,M.V
 354 DO 355 I86=1,N.V
 355 DO 356 J86=1,M.V
 356 DO 357 K86=1,M.V
 357 DO 358 L86=1,M.V
 358 DO 359 I87=1,N.V
 359 DO 360 J87=1,M.V
 360 DO 361 K87=1,M.V
 361 DO 362 L87=1,M.V
 362 DO 363 I88=1,N.V
 363 DO 364 J88=1,M.V
 364 DO 365 K88=1,M.V
 365 DO 366 L88=1,M.V
 366 DO 367 I89=1,N.V
 367 DO 368 J89=1,M.V
 368 DO 369 K89=1,M.V
 369 DO 370 L89=1,M.V
 370 DO 371 I90=1,N.V
 371 DO 372 J90=1,M.V
 372 DO 373 K90=1,M.V
 373 DO 374 L90=1,M.V
 374 DO 375 I91=1,N.V
 375 DO 376 J91=1,M.V
 376 DO 377 K91=1,M.V
 377 DO 378 L91=1,M.V
 378 DO 379 I92=1,N.V
 379 DO 380 J92=1,M.V
 380 DO 381 K92=1,M.V
 381 DO 382 L92=1,M.V
 382 DO 383 I93=1,N.V
 383 DO 384 J93=1,M.V
 384 DO 385 K93=1,M.V
 385 DO 386 L93=1,M.V
 386 DO 387 I94=1,N.V
 387 DO 388 J94=1,M.V
 388 DO 389 K94=1,M.V
 389 DO 390 L94=1,M.V
 390 DO 391 I95=1,N.V
 391 DO 392 J95=1,M.V
 392 DO 393 K95=1,M.V
 393 DO 394 L95=1,M.V
 394 DO 395 I96=1,N.V
 395 DO 396 J96=1,M.V
 396 DO 397 K96=1,M.V
 397 DO 398 L96=1,M.V
 398 DO 399 I97=1,N.V
 399 DO 400 J97=1,M.V
 400 DO 401 K97=1,M.V
 401 DO 402 L97=1,M.V
 402 DO 403 I98=1,N.V
 403 DO 404 J98=1,M.V
 404 DO 405 K98=1,M.V
 405 DO 406 L98=1,M.V
 406 DO 407 I99=1,N.V
 407 DO 408 J99=1,M.V
 408 DO 409 K99=1,M.V
 409 DO 410 L99=1,M.V
 410 DO 411 I100=1,N.V
 411 DO 412 J100=1,M.V
 412 DO 413 K100=1,M.V
 413 DO 414 L100=1,M.V
 414 DO 415 I101=1,N.V
 415 DO 416 J101=1,M.V
 416 DO 417 K101=1,M.V
 417 DO 418 L101=1,M.V
 418 DO 419 I102=1,N.V
 419 DO 420 J102=1,M.V
 420 DO 421 K102=1,M.V
 421 DO 422 L102=1,M.V
 422 DO 423 I103=1,N.V
 423 DO 424 J103=1,M.V
 424 DO 425 K103=1,M.V
 425 DO 426 L103=1,M.V
 426 DO 427 I104=1,N.V
 427 DO 428 J104=1,M.V
 428 DO 429 K104=1,M.V
 429 DO 430 L104=1,M.V
 430 DO 431 I105=1,N.V
 431 DO 432 J105=1,M.V
 432 DO 433 K105=1,M.V
 433 DO 434 L105=1,M.V
 434 DO 435 I106=1,N.V
 435 DO 436 J106=1,M.V
 436 DO 437 K106=1,M.V
 437 DO 438 L106=1,M.V
 438 DO 439 I107=1,N.V
 439 DO 440 J107=1,M.V
 440 DO 441 K107=1,M.V
 441 DO 442 L107=1,M.V
 442 DO 443 I108=1,N.V
 443 DO 444 J108=1,M.V
 444 DO 445 K108=1,M.V
 445 DO 446 L108=1,M.V
 446 DO 447 I109=1,N.V
 447 DO 448 J109=1,M.V
 448 DO 449 K109=1,M.V
 449 DO 450 L109=1,M.V
 450 DO 451 I110=1,N.V
 451 DO 452 J110=1,M.V
 452 DO 453 K110=1,M.V
 453 DO 454 L110=1,M.V
 454 DO 455 I111=1,N.V
 455 DO 456 J111=1,M.V
 456 DO 457 K111=1,M.V
 457 DO 458 L111=1,M.V
 458 DO 459 I112=1,N.V
 459 DO 460 J112=1,M.V
 460 DO 461 K112=1,M.V
 461 DO 462 L112=1,M.V
 462 DO 463 I113=1,N.V
 463 DO 464 J113=1,M.V
 464 DO 465 K113=1,M.V
 465 DO 466 L113=1,M.V
 466 DO 467 I114=1,N.V
 467 DO 468 J114=1,M.V
 468 DO 469 K114=1,M.V
 469 DO 470 L114=1,M.V
 470 DO 471 I115=1,N.V
 471 DO 472 J115=1,M.V
 472 DO 473 K115=1,M.V
 473 DO 474 L115=1,M.V
 474 DO 475 I116=1,N.V
 475 DO 476 J116=1,M.V
 476 DO 477 K116=1,M.V
 477 DO 478 L116=1,M.V
 478 DO 479 I117=1,N.V
 479 DO 480 J117=1,M.V
 480 DO 481 K117=1,M.V
 481 DO 482 L117=1,M.V
 482 DO 483 I118=1,N.V
 483 DO 484 J118=1,M.V
 484 DO 485 K118=1,M.V
 485 DO 486 L118=1,M.V
 486 DO 487 I119=1,N.V
 487 DO 488 J119=1,M.V
 488 DO 489 K119=1,M.V
 489 DO 490 L119=1,M.V
 490 DO 491 I120=1,N.V
 491 DO 492 J120=1,M.V
 492 DO 493 K120=1,M.V
 493 DO 494 L120=1,M.V
 494 DO 495 I121=1,N.V
 495 DO 496 J121=1,M.V
 496 DO 497 K121=1,M.V
 497 DO 498 L121=1,M.V
 498 DO 499 I122=1,N.V
 499 DO 500 J122=1,M.V
 500 DO 501 K122=1,M.V
 501 DO 502 L122=1,M.V
 502 DO 503 I123=1,N.V
 503 DO 504 J123=1,M.V
 504 DO 505 K123=1,M.V
 505 DO 506 L123=1,M.V
 506 DO 507 I124=1,N.V
 507 DO 508 J124=1,M.V
 508 DO 509 K124=1,M.V
 509 DO 510 L124=1,M.V
 510 DO 511 I125=1,N.V
 511 DO 512 J125=1,M.V
 512 DO 513 K125=1,M.V
 513 DO 514 L125=1,M.V
 514 DO 515 I126=1,N.V
 515 DO 516 J126=1,M.V
 516 DO 517 K126=1,M.V
 517 DO 518 L126=1,M.V
 518 DO 519 I127=1,N.V
 519 DO 520 J127=1,M.V
 520 DO 521 K127=1,M.V
 521 DO 522 L127=1,M.V
 522 DO 523 I128=1,N.V
 523 DO 524 J128=1,M.V
 524 DO 525 K128=1,M.V
 525 DO 526 L128=1,M.V
 526 DO 527 I129=1,N.V
 527 DO 528 J129=1,M.V
 528 DO 529 K129=1,M.V
 529 DO 530 L129=1,M.V
 530 DO 531 I130=1,N.V
 531 DO 532 J130=1,M.V
 532 DO 533 K130=1,M.V
 533 DO 534 L130=1,M.V
 534 DO 535 I131=1,N.V
 535 DO 536 J131=1,M.V
 536 DO 537 K131=1,M.V
 537 DO 538 L131=1,M.V
 538 DO 539 I132=1,N.V
 539 DO 540 J132=1,M.V
 540 DO 541 K132=1,M.V
 541 DO 542 L132=1,M.V
 542 DO 543 I133=1,N.V
 543 DO 544 J133=1,M.V
 544 DO 545 K133=1,M.V
 545 DO 546 L133=1,M.V
 546 DO 547 I134=1,N.V
 547 DO 548 J134=1,M.V
 548 DO 549 K134=1,M.V
 549 DO 550 L134=1,M.V
 550 DO 551 I135=1,N.V
 551 DO 552 J135=1,M.V
 552 DO 553 K135=1,M.V
 553 DO 554 L135=1,M.V
 554 DO 555 I136=1,N.V
 555 DO 556 J136=1,M.V
 556 DO 557 K136=1,M.V
 557 DO 558 L136=1,M.V
 558 DO 559 I137=1,N.V
 559 DO 560 J137=1,M.V
 560 DO 561 K137=1,M.V
 561 DO 562 L137=1,M.V
 562 DO 563 I138=1,N.V
 563 DO 564 J138=1,M.V
 564 DO 565 K138=1,M.V
 565 DO 566 L138=1,M.V
 566 DO 567 I139=1,N.V
 567 DO 568 J139=1,M.V
 568 DO 569 K139=1,M.V

C4=RESULT(1, L2-1, L2, 1, M2-1)
 C4A=RESULT(1, L2-1, L2, 0, M2)
 C4RP=RESULT(1, L2-1, L2, -1, M2+1)
 CLR=CLR*CR
 U1A= CLR *GM(IT1 , 12)
 C1P= CLR *GP(IT1 , 12)
 C2A= CLR *GM(IT3 , 11)
 C2P= CLR *GP(IT3 , 11)
 U14=CLC
 U1P=CLC
 U2M=CLC
 U2P=CLC
 IF(CML,L2,CC) GU TC 15
 CMLCK=CML*CR
 C41A= CMLCK *GM(ITM1 , 12)
 C41P= CMLCK *GP(ITM1 , 12)
 15 IF(CLK,L2,CC) GU TC 20
 CLCMR=CL*CMR
 U32A= CLCMR *GM(ITM3 , 11)
 U32P= CLCMR *GP(ITM3 , 11)
 20 IF(LLM,LL,CC,CR,CRP,EE,CC) GU TC 25
 CLC4=CLC*CLP
 U11=CLC *GM(IT1PL,IT2PL)
 U12=CLC *GP(IT1PL,IT2PL)
 U13=CLC *GM(IT3PL,IT4PL)
 U14=CLC *GP(IT3PL,IT4PL)
 U15=CLC *GM(IT1PL,IT2PL)
 U16=CLC *GP(IT1PL,IT2PL)
 U17=CLC *GM(IT3PL,IT4PL)
 U18=CLC *GP(IT3PL,IT4PL)
 25 IF(LLM,LL,CC,CR,CRP,EE,CC) GU TC 30
 U19=CLC *GM(IT1PL,IT2PL)
 U20=CLC *GP(IT1PL,IT2PL)
 U21=CLC *GM(IT3PL,IT4PL)
 U22=CLC *GP(IT3PL,IT4PL)
 30 IF(LLM,LL,CC,CR,CRP,EE,CC) GU TC 35
 U23=CLC *GM(IT1PL,IT2PL)
 U24=CLC *GP(IT1PL,IT2PL)
 U25=CLC *GM(IT3PL,IT4PL)
 U26=CLC *GP(IT3PL,IT4PL)
 35 IF(LLM,LL,CC,CR,CRP,EE,CC) GU TC 40
 U27=CLC *GM(IT1PL,IT2PL)
 U28=CLC *GP(IT1PL,IT2PL)
 U29=CLC *GM(IT3PL,IT4PL)
 U30=CLC *GP(IT3PL,IT4PL)
 40 IF(LLM,LL,CC,CR,CRP,EE,CC) GU TC 45
 U31=CLC *GP(CLK*CRP)
 U32=CLM1P+CLMLCP*GP(ITM1PL,IT2PL)
 U33=CLM1P+CLMLCP*GP(ITM1PL,IT2PL)
 45 If(CLCP,EE,CL,CR,CRP,EE,CC) GU TC 50
 U34=CLCP+CLCRP
 U35=U32P+CLC4RP*GM(ITM3PL,IT4PL)
 U36=U32P+CLC4RP*GP(ITM3PL,IT4PL)
 U37=U11=CLV
 U38=U12=CLP
 U39=U13=CLM
 U40=U14=CLP
 U41=U15=CLV+CLL
 U42=U16=CLP+CLL
 U43=U17=CLV+CLL
 U44=U18=CLP+CLL
 U45=U19=CLP+CLL
 U46=U20=CLP+CLL
 U47=U21=CLV+CLL
 U48=U22=CLP+CLL
 U49=U23=CLV+CLL
 U50=U24=CLP+CLL
 U51=U25=CLV+CLL
 U52=U26=CLP+CLL
 U53=U27=CLV+CLL
 U54=U28=CLP+CLL
 U55=U29=CLV+CLL
 U56=U30=CLP+CLL
 U57=U31=CLV+CLL
 U58=U32=CLP+CLL
 U59=U33=CLV+CLL
 U60=U34=CLP+CLL
 U61=U35=CLV+CLL
 U62=U36=CLP+CLL
 U63=U37=CLV+CLL
 U64=U38=CLP+CLL
 U65=U39=CLV+CLL
 U66=U40=CLP+CLL
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 U68=U42=CLP+CLL
 U69=U43=CLV+CLL
 U70=U44=CLP+CLL
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 U77=U51=CLV+CLL
 U78=U52=CLP+CLL
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 U673=U647=CLV+CLL
 U674=U648=CLP+CLL

NUMBER OF STATEMENTS = 143, PROGRAM SIZE = 12000 BYTES, PROGRAM NAME = GIGL

4.6. CLASIFICACIONES GENERALES

CONTINUATION - * * * * *

SOURCE STATEMENTS = 144, PROGRAM SIZE = 12714 BYTES, PROGRAM NAME = GHCK

THE DIAGNOSTICS GENERATED.

EF COMPILATION + * * * * *

DATE 1984 AUG 07 TIME 17:37:20
 PROJECT NUCLEUS RELEASE NUMBER SOURCE TERM OBJECT FIXED NO
 OPTICAL LANGUAGE(77) NOFIPS FLAG(1) NAME(MAIN) LINECOUNT(85)
 *....1.....2.....3.....4.....5.....6.....7....
 1 SUBROUTINE SHCR
 2 (L*PC,NSPH)
 3 IMPLICIT REAL*8(A-H,O-Z)
 4 CMMCN/DUAC/ RXX(4),KYY(4),RZZ(4),
 5 1RUS(4),CRI(4),XIL(4),
 6 2XIL(4),RM(3,4),SM(3,4),TSAS(2,2),SAC(2,2),
 7 3n(15,2),AI(12),AF(12),AMM(15),AEMO(15),S(15),NAME(40),LOG(4)
 8 CL1M3N/CLM1/C(64,64)
 9 CCMCN/DUM2/GH(64,64),GK(64,64)
 10 CCMCN/DUM6/FACTC(30),FNCRM(28)
 11 CL1PLEX=L G,GH,GK,CCL,CCR,C1,C2,C3,C4,CM1,CM2,CM3,CM4,CC0,XIL,
 12 XIL,RV,SM,n,AI,AF,AMM0,AEM0,S,CRI,TSAS,SAC
 13 CC=0.000
 14 CCD=0.000,0.000
 15 NL4=LMP1*LMP1
 16 N=NSPH*NLM
 17 IC=NF=1,N
 18 IS=1,N
 19 PH(NF,NL)=CC0
 20 SN(NL)=CC0
 21 NL=NSPH-1
 22 N1=-NL
 23 N2=NL+1
 24 N3=N1+N2
 25 N4=N1+N2
 26 N5=N1+N2
 27 N6=N1+N2
 28 N7=N1+N2
 29 N8=N1+N2
 30 N9=N1+N2
 31 N10=N1+N2
 32 N11=N1+N2
 33 N12=N1+N2
 34 N13=N1+N2
 35 N14=N1+N2
 36 N15=N1+N2
 37 N16=N1+N2
 38 N17=N1+N2
 39 N18=N1+N2
 40 N19=N1+N2
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 67 N46=N1+N2
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 284 N263=N1+N2
 285 N264=N1+N2
 286 N265=N1+N2
 287 N266=N1+N2
 288 N267=N1+N2
 289 N268=N1+N2
 290 N269=N1+N2
 291 N270=N1+N2
 292 N271=N1+N2
 293 N272=N1+N2
 294 N273=N1+N2
 295 N274=N1+N2
 296 N275=N1+N2
 297 N276=N1+N2
 298 N277=N1+N2
 299 N278=N1+N2
 300 N279=N1+N2
 301 N280=N1+N2
 302 N281=N1+N2
 303 N282=N1+N2
 304 N283=N1+N2
 305 N284=N1+N2
 306 N285=N1+N2
 307 N286=N1+N2
 308 N287=N1+N2
 309 N288=N1+N2
 310 N289=N1+N2
 311 N290=N1+N2
 312 N291=N1+N2
 313 N292=N1+N2
 314 N293=N1+N2
 315 N294=N1+N2
 316 N295=N1+N2
 317 N296=N1+N2
 318 N297=N1+N2
 319 N298=N1+N2
 320 N299=N1+N2
 321 N300=N1+N2
 322 N301=N1+N2
 323 N302=N1+N2
 324 N303=N1+N2
 325 N304=N1+N2
 326 N305=N1+N2
 327 N306=N1+N2
 328 N307=N1+N2
 329 N308=N1+N2
 330 N309=N1+N2
 331 N310=N1+N2
 332 N311=N1+N2
 333 N312=N1+N2
 334 N313=N1+N2
 335 N314=N1+N2
 336 N315=N1+N2
 337 N316=N1+N2
 338 N317=N1+N2
 339 N318=N1+N2
 340 N319=N1+N2
 341 N320=N1+N2
 342 N321=N1+N2
 343 N322=N1+N2
 344 N323=N1+N2
 345 N324=N1+N2
 346 N325=N1+N2
 347 N326=N1+N2
 348 N327=N1+N2
 349 N328=N1+N2
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 352 N331=N1+N2
 353 N332=N1+N2
 354 N333=N1+N2
 355 N334=N1+N2
 356 N335=N1+N2
 357 N336=N1+N2
 358 N337=N1+N2
 359 N338=N1+N2
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 403 N382=N1+N2
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 408 N387=N1+N2
 409 N388=N1+N2
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 411 N390=N1+N2
 412 N391=N1+N2
 413 N392=N1+N2
 414 N393=N1+N2
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 420 N399=N1+N2
 421 N300=N1+N2
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 618 N307=N1+N2
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 620 N309=N1+N2
 621 N300=N1+N2
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 623 N302=N1+N2
 624 N303=N1+N2
 625 N304=N1+N2
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 628 N307=N1+N2
 629 N308=N1+N2
 630 N309=N1+N2
 631 N300=N1+N2
 632 N301=N1+N2
 633 N302=N1+N2
 634 N303=N1+N2
 635 N304=N1+N2
 636 N305=N1+N2
 637 N306=N1+N2
 638 N307=N1+N2
 639 N308=N1+N2
 640 N309=N1+N2
 641 N300=N1+N2
 642 N301=N1+N2
 643 N302=N1+N2
 644 N303=N1+N2
 645 N304=N1+N2
 646 N305=N1+N2
 647 N306=N1+N2
 648 N307=N1+N2
 649 N308=N1+N2
 650 N309=N1+N2
 651 N300=N1+N2
 652 N301=N1+N2
 653 N302=N1+N2
 654 N303=N1+N2
 655 N304=N1+N2
 656 N305=N1+N2
 657 N306=N1+N2
 658 N307=N1+N2
 659 N308=N1+N2
 660 N309=N1+N2
 661 N300=N1+N2
 662 N301=N1+N2
 663 N302=N1+N2
 664 N303=N1+N2
 665 N304=N1+N2
 666 N305=N1+N2
 667 N306=N1+N2
 668 N307=N1+N2
 669 N308=N1+N2
 670 N309=N1+N2
 671 N300=N1+N2
 672 N301=N1+N2
 673 N302=N1+N2
 674 N303=N1+N2
 675 N304=N1+N2
 676 N305=N1+N2
 677 N306=N1+N2
 678 N307=N1+N2
 679 N308=N1+N2
 680 N309=N1+N2
 681 N300=N1+N2
 682 N301=N1+N2
 683 N302=N1+N2
 684 N303=N1+N2
 685 N304=N1+N2
 686 N305=N1+N2
 687 N306=N1+N2
 688 N307=N1+N2
 689 N308=N1+N2
 690 N309=N1+N2
 691 N300=N1+N2
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 693 N302=N1+N2
 694 N303=N1+N2
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 699 N308=N1+N2
 700 N309=N1+N2
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 702 N301=N1+N2
 703 N302=N1+N2
 704 N303=N1+N2
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 708 N307=N1+N2
 709 N308=N1+N2
 710 N309=N1+N2
 711 N300=N1+N2
 712 N301=N1+N2
 713 N302=N1+N2
 714 N303=N1+N2
 715 N304=N1+N2
 716 N305=N1+N2
 717 N306=N1+N2
 718 N307=N1+N2
 719 N308=N1+N2
 720 N309=N1+N2
 721 N300=N1+N2
 722 N301=N1+N2
 723 N302=N1+N2
 724 N303=N1+N2
 725 N304=N1+N2
 726 N305=N1+N2
 727 N306=N1+N2
 728 N307=N1+N2
 729 N308=N1+N2
 730 N309=N1+N2
 731 N300=N1+N2
 732 N301=N1+N2
 733 N302=N1+N2
 734 N303=N1+N2
 735 N304=N1+N2
 736 N305=N1+N2
 737 N306=N1+N2
 738 N307=N1+N2
 739 N308=N1+N2
 740 N309=N1+N2
 741 N300=N1+N2
 742 N301=N1+N2
 743 N302=N1+N2
 744 N303=N1+N2
 745 N304=N1+N2
 746 N305=N1+N2
 747 N306=N1+N2
 748 N307=N1+N2
 749 N308=N1+N2
 750 N309=N1+N2
 751 N300

VS FORTRAN DATE 10/30/87 TIME 17:39:12
.....1.....2.....3.....4.....5.....6.....7.....
15 20 CONTINUE
16 OM(N1+11, [2])=PI4*SUM1*XILMN
17 OM(N1+12, [1])=PI4*SUM3*XILMN
18 OM(N1+11, [2])=PI4*SUM2*XILMN
19 OM(N1+12, [1])=PI4*SUM4*XILMN
20 30 CONTINUE
21 GO TO 40
22 32 DO 35 I=1,NLM
23 NPI=NL+I
24 DO 35 J=1,NLM
25 OM(NPI,J)=CCC
26 35 OM(NPI,J)=CCC
27 40 CONTINUE
28 RETURN
29 END

LS* SOURCE STATEMENTS = 88, PROGRAM SIZE = 5478 BYTES, PROGRAM NAME = GJMT P1

LS* NO DIAGNOSTICS GENERATED.

LS* COMPILELN 3 ****

OBJECT FIXED NO
SOURCE NAME(MAIN) LINECOUNT(85)
TARGET SOURCE NAME(MAIN) LINECOUNT(77) NO
FLAGGED

.......1.....2.....3.....4.....5.....6.....7.*...

```
14 X=M1M  
15 X=DSURTI(L2)*X/(PI4*MFM)*CG*UCLE8(L2,L3,L1,0,0)  
16 FH=DC4PLX(FJ(LT),FN(LT))*X  
17 AUC1=FJ*DCUNJG(YLM(K))  
18 AUC2=FJ*YLM(K)  
19 SUM1=SUM1+AUC1*XILTI  
20 SU42=SU42+AUC1*XILT  
21 SU43=SU43+AUC2*XILTI  
22 SU44=SU44+AUC2*XILT  
23 20 CONTINUE  
24 G(N1+I1,N2+I2)=PI4*SUM1*XILMN1  
25 G(N1+I2,N2+I1)=PI4*SUM3*XILMN  
26 G(N2+I1,N1+I2)=PI4*SUM2*XILMN1  
27 G(N2+I2,N1+I1)=PI4*SUM4*XILMN  
28 30 CONTINUE  
29 RETURN  
30 END
```

CS* SOURCE STATEMENTS = 89, PROGRAM SIZE = 9850 BYTES, PROGRAM NAME = GHMT PI

CS* NO DIAGNOSTICS GENERATED.

CS* COMPILEATION 2 *****

AFFECT NCLIST NOCMAP NOXREF NOGOSTMT NODECK SOURCE TERM OBJECT FIXED NO
OPT(1) LANGLVL(77) NOFIPS FLAG(1) NAME(MAIN) LINECOUNT(65)

........1.....2.....3.....4.....5.....6.....7....*

1 SUBROUTINE GMHT
2 (LMPC,NSPH,VK)
3 IMPLICIT REAL*8(A-H,D-Z)
4 DIMENSION FJ(100),FN(9),
5 YL4(8),
6 CCOMMON/DUMO/ RXX(4),RYY(4),RZZ(4),
7 IROS(4),CRI(4),XIL(4),
8 XILI(4),RM(3,4),SM(3,4),TSAS(2,2),SAC(2,2),
9 3W(15,2),AI(120),AF(120),AMMO(15),AEMO(15),S(15),NAME(40),I0G(4)
0 COMMON/DUM1/G(64 64)
1 COMMON/DUM6/FACT0(30),FNCRM(28)
2 CPLEX*16 G,XIL,XILI,YLM,XILMN,XILMNI,SUM1,SUM2,SUM3,SUM4,
3 XILT,XILTI,FH,AUC1,AUC2,CC0,RM,SM,M,AF,AMMO,AEMO,S,CRI,TSAS,SAC
4 DATA P14/ 12.56637C614356/
5 JCK=90
6 CCC=(0.000,0.000)
7 NL4=LMPC+LMPC
8 N=NSPH*NLM
9 LMTPC=LMP0+LMPC-1
0 LT=LMTPC-1
1 DC 10 NF=1,N
2 DC 10 NS=1,N
3 J(A,F,NS)=CCC
4 N4C=NSPH-1
5 N1=-NL4
6 DC 30 NF=1,NSML
7 N1=N1+NLM
8 N2=(NF-1)*NLM
9 NFP0=NF+1
0 DC 30 NS=NFP0,NSPH
1 N2=N2+NLM
2 KX=RXX(NS)-RXX(NF)
3 RY=RYY(NS)-RYY(NF)
4 RZ=RZZ(NS)-RZZ(NF)
5 CALL PCLAR(RX,RY,RZ,RR,CRTH,SRTH,CRPH,SRPH)
6 CALL SPHAR(CRTH,SRTH,CRPH,SRPH,LMTPO,YLM)
7 ARG=KK*VK
8 CALL RBF(ARG, LMT,JCK,FJ)
9 CALL RNF(ARG, LMT,FN)
0 DC 30 LF=1,LMP0
1 L1=LF-1
2 IL1=LF*L1+1
3 MF1=LF+L1
4 M1=-LF
5 DC 30 MF=1,MFM
6 M1=M1+1
7 IL1=IL1+M1
8 DC 30 LS=LF,LMPU
9 L2=LS-1
0 IL2=LS*L2+1
1 L2=-L2
2 IF(L2.EQ.L1)ML=M1
3 LMAXPC=LS+L1
4 LMINPC=LS-L1
5 XILMN=XIL(LMINPC)
6 XILMNI=XIL(LMINPC)
7 MS4=LS-ML
8 L2T=LS+L2
9 M2=ML-1
0 DC 30 MS=1,MSM
1 M2=M2+1
2 IL2=IL2+M2
3 SL41=CC0
4 SL42=CC0
5 SL43=CC0
6 SL44=CC0
7 XIL1=-XILMN
8 XILTI=-XILMNI
9 DC 20 LT=LMINPC,LMAXPC,2
0 XILT=-XILT
1 XILTI=-XILTI
2 L3=LT-1
3 M3=M1-M2
4 CG=DCLEB(L2,L3,L1,M2,M3)
5 IF(CG.EQ.0.0E0) GO TO 20
6 K=LT+L3+M3+1
7 IF(CDABS(YLM(K)).LT.1.0D-8)GO TO 20
8 MTM=LT+L3

REPORT NO. - OTSUTIL ICCF LIBRARY FILE MAINTENANCE
1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75.

```
WRITE(IW,6050)(S(I),I=IINR,IFNR)
IF(IFNR.EQ.NLMM) GO TO 328
IINR=IFNR+1
IFNR=IFNR+4
GO TO 325
328 IF(JJ.EQ.1) GO TO 350
JJ=1
WRITE(IW,6060)
IF(JIN.EQ.1) GO TO 335
CL 330 I=1,NLMM
330 S(I)=AEM0(I)
CL TO 285
335 CL 340 I=1,NLMM
II=I+IN
340 S(I)=AF(II+NM)
CL TO 285
350 IN=IN+NLMM
355 WRITE(IW,6080)
IF(JIN.EQ.NSPH) GO TO 370
360 JIN=NSPH
CL TL 260
370 SCARAT=S CASEC/SCS
IF(ICPI.NE.0) GO TO 380
ABSRAT=1.000
CL TL 305
380 ABSRAT=ABSSEC/ACS
385 TUTRAT=TCTSEC/TCS
SCA=S CASEC/GCS
GABS=ABSSEC/GCS
WTCT=TCTSEC/GCS
IF(NHELP.EQ.1) TSAS(ISA,ISA)=TSAS(JSA,JSA)
REFINK=DREAL(SAC(ISA,ISA))/DREAL(TSAS(ISA,ISA))
ABSCOR=DIMAG(SAC(ISA,ISA))/DIMAG(TSAS(ISA,ISA))
WRITE(IW,6100) TSASEC,ABSSEC,TCTSEC
WTIT(IW,6110) SCARAT,ABSRAT,TUTRAT
WTIT(IW,6120) JSA,ISA,SAC(ISA,ISA),JSA,ISA,SAC(JSA,ISA)
WTIT(IW,6130) ISA,ISA,REFINK,ISA,ISA,ABSCOR
IF(NHELP.EQ.1) GO TO 100
SCA=(DREAL(SAC(JSA,ISA))-DREAL(SAC(ISA,ISA)))/DREAL(SAC(JSA,ISA))
100 SCAC=(DIMAG(SAC(JSA,ISA))-DIMAG(SAC(ISA,ISA)))/DIMAG(SAC(JSA,ISA))
110 WTIT(IW,6140) JSA,ISA,REFINK,ISA,ISA,EDICHR
120 READ(10,2000)
130 STEP
140 END
```

END PRINT 239 RECORDS

REPORT NO. - CTSUTIL ICCF LIBRARY FILE MAINTENANCE

100..5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80

REPORT NO. - 080102 1001 LIBRARY FILE MAINTENANCE

1000.2000.3000.10000.12000.20000.30000.35000.40000.45000.50000.55000.60000.65000.70000.75000.

REPORT NO. - DTSTUFILE LOGIC LIBRARY FILE MAINTENANCE
10005...10...10...20...25...30...35...40...45...50...55...60...65...70...75...

* * * * * 1 * * * * * 2 * * * * * 3 * * * * * 4 * * * * * 5 * * * * * 6 * * * * * 7 * * *

DOCUMENT STATEMENTS = 62, PROGRAM SIZE = 5780 BYTLES, PROGRAM NAME = SZUT P

6.34. NO. OF DIAGNOSTICS GENERATED.

THE COMPILATION • * * * * *


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      *....*...1.....2.....3.....4.....5.....6.....7.*....*
      SUBROUTINE RSM
      (LMPC,NGRMX,VK)
      IMPLICIT REAL*8(A-H,D-Z)
      COMMON/DUMD/ RXX(4),RYY(4),RZZ(4),
      TRS(4),CR1(4),XIL(4),
      XILI(4),RM(3,4),SM(3,4),TSAS(2,2),SAL(2,2),
      BN(15,2),AI(120),AF(120),AMMO(15),AEMO(15),S(15),NAME(40),IUG(4)
      DIMENSION
      LCFJ(100),FN(6),FJ(100)
      COMPLEX*16 RM,SM,CR1,CFJ,CRII,VKN,DCFJ,A,B,C,D,XIL,XILI
      I,J,AI,AF,AMMO,AEMO,S,TSAS,SAC
      JCL=95
      LM=LMPC-1
      LMPT=LMPC+1
      DO 20 I=1,NGRMX
      ICG(I)=IUG(I)+1
      IF(ICG(I).GT.I) GO TO 6
      ICG(I)=ICG(I)-1
      DO 5 L=1,LM
      C(L,I)=RV(L,ICG(I))
      S(L,I)=SA(L,ICG(I))
      T(I)=0
      V(I)=VX*(C(L,I))
      E(I)=0
      DO 14 L=1,LM
      F(L,I)=V(KR*(VKR)+L*D)+C(L*D)+T(I)
      G(L,I)=V(VK+L*D)+JCL+CFJ
      H(L,I)=V(VK+L*D)+LMPL+JCL+FJ
      I(L,I)=V(VK+L*D)+2*LMPL
      L=L+1
      E(I)=E(I)+1
      E(I)=E(I)+1
      FN=(L+FJ(L))-L*D*FN(LDPC))
      CFJ=(L+FJ(L))-L*D*FJ(LDPC))
      SDFJ=(L*CFJ(L))-L*D*CFJ(LDPC))
      A=CFJ(L)*((VKR*DFN+FN(LD))+E)
      B=VK*(DCFJ+CFJ(LD))+E
      C=CFJ(L)*(VKR*DFN+FJ(LD))+E
      D=FJ(L)*B
      E=FJ(L)*B
      F=(L,I)=1.000/(1.000+(0.000,1.000)*((A-B)/(C-D)))
      G=(L,I)=1.000/(1.000+(0.000,1.000)*((CRII+A-B)/(CRII+C-D)))
      H=(L,I)=1.000
      I=(L,I)=1.000

```

DATA NAME = D1, DATA ID = 1138, BYTES = 1138, PROGRAM NAME = RSD, PAGE

REFERENCES AND NOTES

卷之三十一

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SUBROUTINE AUXIL
1(LMPU)
IMPLICIT REAL*8(A-F,C-Z)
JC140/1/DU10/, RXX(4), RYY(4), RZZ(4),
1RCS(4), CR1(4), XIL(4),
2XIL1(4), KM(3,4), SM(3,4), TSAS(2,2), SAC(2,2),
3A(15,2), AI(120), AF(120), AMMO(15), AEMO(15), S(15), NAME(40), IOG(4)
COMMON/DU40/FACTC(3C), FACTRM(2d)
COMPLEX*16 XIL, XILI, CRI, KM, SM, h, AI, AF, AMMO, AEMO, S, TSAS, SAC
DATA PI/4/ 12.566370614356/
NFAC=3C
FACT0 (1)=1.000
DU 1 I=2,NFAC
A=I-1
FACT0 (1)=A*FACTC (I-1)
LMTPC=LMPU+LMPD-1
DC 5 LF=1,LMTPC
L=LF-1
CTP=LF+L
DC 5 IY=1,LF
A=I+1
L=A=LF-1
I=I+1
IF(I.EQ.L) GOTO 10
A=FACTC(LY+1)/FACTC(LY)
DC 5
LY(L)=DU,L*(A)
I=I+1
A=1
XIL1(I)=1
SIL (I)=1
IF(I.EQ.LMPU) DU 10 15
I=I+1
XIL1(I)=(2.0DC, -1.0DC)
SIL (I)=(0.0DC, 1.0DC)
IF(I.EQ.LMPC) DU 10 15
I=I+1
XIL1(I)=-1
SIL (I)=-1
IF(I.EQ.LMPC) DU 10 15
I=I+1
XIL1(I)=(2.0DC, 1.0DC)
SIL (I)=(0.0DC, -1.0DC)
IF(I.LT.LMPC) DU 10 12
10 RETURN

```

MAIN STATE WORD = 92, PELSBY STATE = 2809 BYTES, PROGRAM NAME = AUXIL

• **ADMISSIONS ENTITLED.**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

FILE(1) NAME(LEVEL77) RECIPS SOURCE TERM OBJECT FIXED NO
FLAG(1) NAME(MAIN) LINECOUNT(85)

....1.....2.....3.....4.....5.....6.....7....

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1      FUNCTION DULEB(JA,JB,JC,MA,MB)
2      IMPLICIT REAL*8(A-H,L-Z)
3      COMMON/DUMC/FACTC(30),FACTM(28)
4      MC=MA+MB
5      IF(MA-JA)4,4,3
6      DULEB=0.00
7      GOTO35
8      IF(MA+JA)5,6,6
9      DULEB=0.00
10     GOTO35
11     IF(MB-JB)8,9,7
12     DULEB=0.00
13     GOTO35
14     IF(MB+JB)9,10,10
15     DULEB=0.00
16     GOTO35
17     IF(MC-JC)12,12,11
18     DULEB=0.00
19     GOTO35
20     IF(MC+JC)13,14,14
21     DULEB=0.00
22     GOTO35
23     IF(MA-JA-JB)11,11,10
24
25     JJ1=1
26     JJ2=JJ1+JA-1
27     JJ3=JJ1+JA+1
28     JJ4=JJ1+JA+JA+1
29     JJ5=JJ1+JA+1
30     JJ6=JJ1+JA+1
31     JJ7=JJ1+JA+1
32     JJ8=JJ1+JA+1
33     JJ9=JJ1+JA+1
34     JJ10=JJ1+JA+1
35     JJ11=JJ1+JA+1
36     JJ12=JJ1+JA+1
37     JJ13=JJ1+JA+1
38     JJ14=JJ1+JA+1
39     JJ15=JJ1+JA+1
40     JJ16=JJ1+JA+1
41     JJ17=JJ1+JA+1
42     JJ18=JJ1+JA+1
43     JJ19=JJ1+JA+1
44     JJ20=JJ1+JA+1
45     JJ21=JJ1+JA+1
46     JJ22=JJ1+JA+1
47     IF(JJ17)17,17,20
48     IF(JJ18)18,18,19
49     K=1
50     GOTO24
51     K=JJ19
52     GOTO24
53     IF(JJ15)21,21,22
54     K=JJ17
55     GOTO24
56     IF(JJ16)21,21,21
57     K=JJ18
58     GOTO24
59     IF(JJ17-JJ16)19,19,21
60     K=JJ21-JJ15
61     GOTO24
62     IF(JJ17-JJ16)23,23,27
63     K=JJ18
64     GOTO24
65     IF(JJ17-JJ16)23,23,23
66     K=JJ19
67     GOTO24
68     K=JJ18
69     GOTO24
70     K=JJ19
71     K=(K-1)*FACTC(JJ11)*FACTC(JJ12)*FACTC(JJ13)
72     K=FACTC(JJ14)*FACTC(JJ15)*FACTC(JJ16)
73     S1=50.0+30.0/PRC.GU
74     IF(1-KK)33,34,34
75     K=K+1
76     K=Y=-1.0*Y
77     GOTO24
78     K=K+1
```

.....7.0....

1. SQA 1=ANL*FACTL (JJ1)*FACTL (JJ2)*FACTL (JJ3)
2. SQA 2=FACTL (JJ4)
3. SQA 3=FACTL (JJ5)*FACTL (JJ6)*FACTL (JJ7)
4. 1*FACTL (JJ4)*FACTL (JJ9)*FACTL (JJ10)
5. SQA 4=SQA 1*SQA 3/SQA 2
6. DCLEB=SUM*USGRK(SQA 4)
7. RETURN
8. END

L54 SOURCE STATEMENTS = 64, PRLKAM SIZE = 4774 BYTES, PROGRAM NAME = DCLEB

L55 NO DIAGNOSTICS GENERATED.

L56 COMPILED 12 *****

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      SUBROUTINE R8F(X,N,JCK,FJ)
      IMPLICIT REAL*8(A-H,L-Z)
      DIMENSION FJ(100)
      ICK=JCK
      IF (X-1.E-3) 7,11,11
      7 FJ(1)=1.
      IF (.)10,13,8
      8 N=N+1
      9 CL 9 N=2,MM
      9 FJ(N)=0.
      10 CL TC 50
      11 FNC=1.04*X+6.5
      TST=4.21+.34294415*DLLG(X)+3.
      IF (2.-TST)13,12,12
      12 DELTA=2.
      CL TC 14
      13 DELTA=TST
      14 FJ=.1
      IF (FN-FNC)15,15,16
      15 FN=FNC+DELTA
      16 FN=FNC-DELTA
      17 N=N+1.
      18 CL TC 17
      19 FJ=FNC
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      661 FJ=FNC
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      679 FJ=FNC
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      689 FJ=FNC
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      695 FJ=FNC
      696 CL TC 356
      697 FJ=FNC
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      717 FJ=FNC
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      1112 CL TC 564
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      1114 CL TC 565
      1115 FJ=FNC
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      1117 FJ=FNC
      1118 CL TC 567
      1119 FJ=FNC
      1120 CL TC 568
      112
```

1.5 UC STATEMENTS = 54, PROGRAM SIZE = 3014 BYTES, PROGRAM NAME = RBF PAGE

Finally, as * * * * *

..... ..1.....2.....3.....4.....5.....6.....7.*....

```

1 SUBROUTINE RKF(X,L,FN)
2 IMPLICIT REAL*8(A-H,C-Z)
3 DIMENSION FN(C)
4 IF (X.LT.0.0DC0.CK.L.LT.0) RETURN
5 LPU=L+1
6 IF (X.GT.0.0DC0.CK.L.LT.0) GL TC 20
7 DO 10 I=1,LPC
8 FN(I)=-0.0D50
9 10 FN(1)=FN1=-DCOS(X)/X
10 FN2=(FN1-DSIN(X))/X
11 FN(1)=FN1
12 FN(2)=FN2
13 IF(L.LT.2) RETURN
14 XI=1.0D0/X
15 LMU=L-1
16 DO 30 I=1,LMU
17 IPT=I+I+1
18 IPT=I+2
19 FN(I)=FN1
20 FN(I)=FN2
21 FN(I)=FN1*X+I*PFL-FNC
22 30 FN(I)=FN2
23 END

```

10. **NAME OF THE PERSON TO WHOM THIS VOTING RIGHT IS ASSIGNED** = 1000 VOTES. **PROXYMAN NAME** = KMF. **PAC**

2.3. *Scutellariae* sensu lato.

U.S. APPLICATION NO. 14-066446

PROGRAM SIZE = 5113 BYTES, PROGRAM NAME = CNT PAC

REFERENCES AND NOTES

1. *Chlorophytum comosum* L. (Liliaceae) 2. *Crinum asiaticum* L. (Amaryllidaceae)

NAME: JOHN P. BROWN MIDDLE NAME: JAMES LAST NAME: BROWN DATE OF BIRTH: 10/10/1945 ADDRESS: 12345 FAIRFIELD DR. CITY: FAIRFIELD STATE: OHIO ZIP CODE: 45014 PHONE NUMBER: (513) 555-1234

*.....*1.....*2.....*3.....*4.....*5.....*6.....*7.*....

```

SUBROUTINE POLAR(X,Y,Z,R,CTH,STH,CPh,SPH)
IMPLICIT REAL*8(A-F,C-Z)
RF=X*X+Y*Y
IF(RFH.GT.0.0DC) GL TL 10
CPh=1.0DC
SPH=0.0DC
R=DA3S(Z)
IF(R.GT.0.0DC) GC TL 15
CTH=1.0DC
STH=0.0DC
RETURN
10 X=DSQRT(RFH+Z*Z)
RFH=DSQRT(RFH)
CPh=X/RFH
SPH=Y/RFH
15 CTH=Z/R
STH=RFH./R
RETURN
END

```

PROGRAM NAME = PULAR

JOURNAL OF CLIMATE

¹ See also the discussion of the relationship between the two concepts in the section on "Theoretical Implications."

REFERENCES AND NOTES

1000 18 FEBRUARY 1943 1000000000 1146 17 40 30

وَلِلَّهِ الْحُكْمُ وَإِلَيْهِ الْمُرْجَعُ

CODE STacks/EQU = 64, PROGRAM SIZE = 6592 BYTES, PROGRAM NAME = CSMINV

THE STATISTICS GENERATED.

APPENDIX 1E ■■■■■■■

149931 VS FURTHEAN DATE 1984 NOV 07 TIME 1

ST NCCLIST MAP NCXREF GOSTM1 NCDFUK SOURCE TERM OBJECT FIX
CPT(0) LA.SLVL(66) NCPIFS FLAG(1) NAME(MAIN) LINECOUNT(5)

```

*....+...1.....2.....3.....4.....5.....6.....7.

SUBROUTINE AUXIL
10 L54C,JCR,JSC,VK)
14P1CIT KFLAL*(4-H,C-2)
SIRESION YLY(31),FJ(100),EN(S)
COMPLEX#1c YLW
CC44 /D40/ RXX(3),RYY(3),RZZ(3),RGS(3),RRI(3),
1VC(S(9825),V1(27),VYH(243),VJ(27),VYJ(243)
2,4(1,3),SM(4,3),TSAS(2,2),SAC(2,2),
3(24,1),AI(14,1),AMN(24),AEYC(24),S(24),NAME(40),LG(3)
COMPLEX#1c C(1,VF,VYH,VYJ,FM,SM,TSAS,SAC,
1n,4,4,4T24MV,4E,1S
CC /D40/ FRACT(40),FACTM(45)
2,4 /1,1TCM/LMPC,LM,NLM,NLMM,N,NM,NDIM,NSPH,LMTPLS,LMT,LMTPLS,
1,3 4,1,X,XS,VMXN
2,4 TA P14/ 12.20637261+35e/
IF(JG0,RE,1) GO TO 18
LM=L20-1
NL=LM-LMPC
NL=NL-1
N=1SPH4NLV
NM=1-VSPH
NL2=NL+NM
LMPC=LMPC+LMPC-1
LM=LM-LMPC-1
LMPC=LMPC+LMPC
NM=NL-SPH-1
NL=NL-SPH+LMPC
NM=NL-SPH+LMPC
NM=NL-SPH+LMPC
FACT(1)=1.000
DO 1 I=2,FACT
A=I-1
2,4 A=A*FACT(I-1)
2,4 LF=1,LMPC
2,4 L=LF-1
2,4 LM=LF+L
2,4 LM=L-1,LF
2,4 I=I-1
2,4 LF=LF-1
2,4 LM=LM+1
2,4 N=L+L/2+1M
A=L/103*FACT(LM)/FACT(LFM)
A=1/P14
3,4 A=(A-DSS)-T(A)
3,4 L=17,LF=1,LMPC
3,4 L=LF-1
3,4 LM=LF+L1
3,4 LM=-LF
3,4 17*F=1,MSV
3,4 I=I+1
3,4 L=17,L3=1,LMPC
3,4 L=L3-1
3,4 LM=L3+LM
3,4 LM=-LS
3,4 LM2=14*S(L2-L1)+1
3,4 LM4XP=LS+L1
3,4 L=17*S=1,MSA
3,4 M2=MS+1
3,4 V2=V1+M2
3,4 L=17,LT=L2*1,PL,LM4XP
3,4 L3=LT-1
IF(M3,LT,-L3,LR,M3,GT,L3) GO TO 17
IV=IV(L1,L2,L3,M1,V2,M3)
V00(V)=ULG(L1,L2,L3,M1,V2,V3)
5,7 T10UE
15 IF(JG0,ST,2) RETURN
IVY=0
IVY=0
IVY=0
3,4 32,LF=1,NSPH
3,4 LR=IV+1
3,4 32,L3=NSPL,NSPF
3,4 RA=RAX(VS)-RXX(NF)
3,4 RY=RYY(VS)-RYY(NF)
3,4 RZ=RLZ(VS)-RZZ(NF)
CALL PELAR(RA,RY,RZ,RAUCFH,SRTH,CRPH,SPRH)
CALL SPFAK(CRTH,SRTH,CRPH,SPRH,LMTPLS,YLM)
3,4 20 IV=1,LMTPS
IV=IV+IVY

```

1983)

VS FORTRAN

DATE 1964 NOV 07

TIME 17

54

1 NOLIST MAP NOXREF GLSTYR RODECK SOURCE TLFN OBJECT FIXE LINECOUNT(55)

OPT(0) LANGLEV(00) NFIPS FLAG(1) NAME(MAIN) LINENO(75)

.....#....1.....2.....3.....4.....5.....6.....7..

Subroutine RSM

1 (LVPB,VRXX,VK,JCL)

1 P10111 L=I+P(A-B),(-Z)

1 VVJ(143),RXX(3),RYY(3),RZZ(3),RCS(3),RA1(3),

1 VCS(53622),VH(27),VYH(243),VJ(27),VYJ(243)

2 F4(4+,3),SM(4,3),TSAS(2,2),SAU(2,2),

3 A(24,2),A1(144),AF(14+),AVM(24),AEVC(24),S(2+),NAME(40),LUG(3)

4 VVJ(143),VH,VYH,VYJ,FN,SM,TSAS,SAU,

1n,1I,AF,AVM,AEVC,S

2 VVJ(143)

1 FJ(12),FN(7),FJ(100)

2 CALL EX10 (FJ,CRII,VKR,JCL,FN,A,B,C,D)

3 L=L+PC-1

4 L=VPC+1

5 I=1,16

6 J=I+1,I+1

7 IF(I>GI,GT,I) GO TO 6

8 J=I+1-1

9 S=L,I,L

10 (L,I)=FJ(L,IGI)

11 S(L,I)=S*(L,IGI)

12 FN=20

13 VRK<=VK*(C-1)

14 CRII=CRII(1)

15 VRK=VK*PC*CRII

16 CRII=CRII*(C-1)

17 IF(DIAG(VKR)*PC>0.0001) GO TO 7

18 CALL CRII(VKR,LVPB,JCL,FJ)

19 L=1

20 VRK=0.001(VKR)

21 CALL CRII(VKR,LVPB,JCL,FJ)

22 J=1,L+1

23 FJ(J)=FJ(J)

24 CALL CRII(VKR,LVPB,JCL,FJ)

25 CALL CRII(VKR,LVPB,FN)

26 L=L+1,L

27 L=L+1

28 L=L+1

29 U=(L3*FA(L)-L3*FN(L,PC))

30 J=V3*FJ(L)-L3*FJ(L,PC)

31 U=(L3*FJ(L)-L3*U(L,PC))

32 R=3*J(L,PC)*(V3*U(L,PC)+FN(L,PC)*E)

33 S=V3*(L3*FJ+U(L,PC)*E)

34 U=FJ(L,PC)+(VK*U(L,PC)+FJ(L,PC)*E)

35 C=FJ(L,PC)*E

36 C=FJ(L,PC)*E

37 C=(L3*3/(1.0+((C*3*PC,1.0*C)*((A-B)/(C-D))))

38 C=(L,1)=1.0*3/(1.0+((C*3*PC,1.0*C)*((CRII*A-B)/(CRII*C-D))))

39 C=1.0

40 FJ(L,PC)

41 FJ(L,PC)

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VS TURKAN

DATE 1984 NOV 07

TYPE II - 52

```

      NCLIST   MAP  NCXEEF  GLSTWT  NCDECK  SOURCE  TERM    OBJECT  FIXE
      PT(0)  LAMSLVL(00)  NEFIPS  FLAG(1)  NAME(MAIN )  LINECOUNT(1165)
*....1.....2.....3.....4.....5.....6.....7.*...
      SUBROUTINE YLM
      1(KHLLP,TH,PH,LMPC)
      1(IPLICIT REAL*8(H,L-2))
      1IMAGIN YLM(2e)
      1C14,V00407,MAX(3),KYY(3),KZZ(3),RLS(3),CF1(3),
      1V00(20000),V1(27),VYH(243),VJ(27),VYJ(243)
      1C14,21,3(4,3),TSAS(2,2),S30(2,2),
      1A(24,2),AI(144),AF(244),AE(24),S(24),NAME(40),LS(3)
      1C4PL=16,L-1,VE,VYH,VYJ,SM,TSAS,SAC,
      1A,A1,AF,AV,AT,C,S
      1C4PL=16,FACLU(40),FACTU(45)
      1C4PL=13,YL2,AP,AM,AL,UL
      1DATA J14/ 12.566373614358/
      1LMP=L'PC4LMP+1
      1YL4(L,P)=(0.000,0.000)
      1HLLP=1
      1F(KHLLP,B1,2) 1HLLP=-1
      1P=-1 1HLLP
      1C14=DCS(TH)
      1S14=DSIN(TH)
      1CS14=DCOS(TH)
      1S14=DSIN(TH)
      1C14=DCS(PH)
      1S14=DSIN(PH)
      1CALL SP14(S14,SI,T,ULSP,SINP,LMPC,YLM)
      1ALPH1=-S14*T*ULSP
      1BETA1=-C14*T*SINP
      1A11=S14*T
      1ALPH2=S14*P
      1BETA2=-C14*P
      1C14=DCS(PH)
      1S14=DSIN(PH)
      1ALPH1=DCMPLX(ALPH1,P*ALPH2)+DCMPLX(BETA1,P*BETA2)*(0.500,1.000)
      1BETA1=DCMPLX(ALPH1,P*ALPH2)-DCMPLX(BETA1,P*BETA2)*(0.500,1.000)
      1A11=DCMPLX(C14,T,P*C14*P)
      1C14=CF2,LMPC
      1C14=CF-1
      1T1=L-1
      1A=L14*(0.500,1.000)*PL/DSQRT(X)
      1C14=CF+1
      1C14=CF-1
      1C14=CF-1,M=1.000
      1V=V+1
      1Z=CF1*L+M
      1Y=CF1*L-V+(V+1)
      1C=C14-T(X)
      1X=LFTL-V*(V-1)
      1C=C14-T(X)
      1C=C14
      1C=C14*(C14)=DC14+DC((AP*CP*YLM(K+2)+AP*CM*YLM(K)+AL*CL*YLM(K+1))/CL
      1C=C14

```

MAY 1963) VS FORTRAN DATE 1984 NOV 07 TIME 17:49
 FECT NELIST MAP NCXREF GLSTMT NCDECK SOURCE TERM OBJECT FIXE NC
 OPT(0) LANGLEV(6) NCFIPS FLAG(1) NAME(MAIN) LINECOUNT(85)
1.....2.....3.....4.....5.....6.....7.*...
 SUBROUTINE SZOT
 1 IMPLICIT REAL*8(A-H,O-Z)
 UCYC=0.04P/RXX(3),KYY(3),RZZ(3),RCG(3),CRG(3),
 1 VCG(50629),VH(27),VYH(243),VJ(27),VYJ(243)
 2, AI(1+,3),SM(4,3),TSAS(2,2),SAC(2,2),
 3A(24,2),AI(144),AH(144),AV(123),AEYC(24),S(24),NAME(40),ICG(3)
 UCPLEX*10 CFI,VH,VYH,VYJ,RM,SM,TSAS,SAC,
 1, AI,AF,ANM,AEMC,S
 UC 10./0.05/AV(144,144),AV(144),V(144)
 UC PLEX*10 AV,PV
 UC ATOM/INTC/LMPC,LK,NLM,NLM,NM,NCIM,NSPH,LNTPL,LNT,LNTPLS,
 1, S, NXX,NXS,NNM
 UC SPLEX*10 CC2,ULM,CLM,SCM,SSMSP,SSESP,PHAS
 UC =0.000
 UC=(0.000,0.000)
 IF(IHELP.EQ.1) GO TO 20
 IS4=2
 JS4=1
 20 TU 30
 20 IS4=1
 JS4=2
 30 IF(TP.NE.0) GO TO 60
 I1=0
 DO 30 I1=1,NSPH
 DO 30 I1=1,LK
 DO 30 SP=R'(L1,K1)
 DO 30 SP=S'(L1,K1)
 L1TPU=I1+L1+1
 I1=-L1-1
 DO 30 I1=1,L1TPU
 I1=I1+1
 I1=I1+1
 30 I1=0
 I2=0
 DO 40 I2=1,L2
 L2TPU=I2+L2+1
 K2=-L2-1
 DO 40 I2=1,L2TPU
 I2=I2+1
 I2=I2+1
 40 SP=I2+K(12,IS4)+(GCA(1,I1,L1,M1,L2,K2)*IHELP+GIM(1,I1,L1,M1,L2,K2))
 IF(VOLTIN.EQ.0.0) GO TO 47
 SP=0.0E0(SUM)
 SUI=0.0AG(SUM)
 IF(.NOT.(SUI).LT.VOLTIN) SUI=0.0
 IF(.NOT.(SUI).LT.VOLTIN) SUI=0.0
 SUI=0.0(RPK(SU1,SUI))
 50 SV(11)=SUI*SSMSP
 50 SV(11+K1)=-SU1*SSESP*IHELP
 RETURN
 60 UK=VK*DSC(THK)*DCCS(PHK)
 CKY=VK*DSC(THK)*DSIN(PHK)
 UKZ=VK*DCCS(THK)
 60 T0 I=1,NSPH
 IJ=(I-1)*LK
 PKH=CKX*KAA(I)+CKY*RYY(I)+CKZ*RZZ(I)
 PKS=C3LXP((0.0,1.0)*PKH)
 K=1
 KTPU=K+K+1
 SSMSP=K4(K,I)
 SSELSP=S'(K,I)
 70 J=1,LK
 IJ=IJ+J
 SV(11)=-K(J,IS4)*PHAS*SSMSP
 SV(11+K1)=-K(J,IS4)*PKAS*SSESP*IHELP
 IF(J.LT.KTPU) GO TO 70
 K=N+1
 KTPU=KTPU+K+K+1
 SSMSP=N4(K,I)
 SSELSP=S'(K,I)
 70 CUY,TINGE
 RETURN
 END

381 12-31

VS FORTRAN

DATE 1984 NOV 07

TYPE 17

15

(MAY 1983)

VS FORTRAN

DATE 1984 NOV 07 TIME 17 35 27

EFFECT NOLIST MAP ACKREF GOSIMT VODECK SOURCE TERM OBJECT FIXED NO
OPT(0) LANGEVL(66) NUFIPS FLAG(1) NAME(MAIN) LINECCU,T(85)

.......1.....2.....3.....4.....5.....6.....7.*...

SUBROUTINE CHESSE

```

11VK,IHELP,
2SCASEC,ABSSFC,TOTSEC,VGUTA)
12PLICIT REAL*8(A-F,C-Z)
13AM=V0000/VXX(3),KYY(3),RZZ(3),RCS(3),CRI(3),
14VG(50025),VH(27),VYH(243),VJ(27),VYJ(243)
15R4(4,3),S4(4,3),TSAS(2,2),SAC(2,2),
16(24,2),AI(144),AF(144),ANMC(24),AEAC(24),S(24),NAME(40),IGG(3)
17C4PLEX#16 C1,VH,VYH,VYJ,FM,SM,TSAS,SAC,
18,I,AF,ANM,AEM,S
19CGM,V1,TUGA/LMPC,LV,LEN,ALMV,N,AM,ADIM,ASPH,LMTPL,LMT,LMTPCs,
20VS10,V12,NAAS,IVXM
21C4PLEX#10 G1F,GLP,AM,AE,GI,GL,SLMV,SUME,CC0,CCN,CFDET
22C0=0.000
23CD=(C0+C1+C2+C3)/4.000
24CR=0.5/(VK*VK)
25A1=(-C0*CD,1.0CD)*(0.5*CR/VK)
26IF(IHELP.EQ.-1) GC TO 10
27JSA=1
28JSA=2
29GC TO 12
3013A=2
31JSA=1
3211=0
3320 LI=1,LN
34L1TPC=L1+LI+1
35LI=-L1-1
3620 I'1=1,L1TPC
37I1=V1+1
38I1=I1+1
39I1=0
40J1=CC0
41SI=CC0
4215 I2=1,L2TP
43I2=1,L2
44L2TPC=L2+L2+1
45I2=-L2-1
4620 I3=1,L2TPC
47I3=42+1
48I2=I2+1
49I2=AF(I2)
50AE=AF(I2+.M)
51SI=GIP(L1,V1,N2,L2,V2)
52GL=GLP(L1,V1,N2,L2,V2)
53SU1=S1*AM+ANM+I+AE+GL
54SU2=SUMC+AMC+AE+AE+SI
55AV1=(I1)=SUME
56AF1=(I1)=SUME
57IF(VGUTA.EQ.CC) GC TO 27
5820 I=1,NEV
59AM=DRKAL(ANMC(I))
60AV1=DRKAL(ANMC(I))
61AE=DRKAL(AEMC(I))
62AE1=DIMAC(AEMC(I))
63IF(DA8S(AMR).LT.VGUTA) AMR=CC
64IF(DA8S(AM1).LT.VGUTA) AM1=CC
65IF(DA8S(AER).LT.VGUTA) AER=CC
66IF(DA8S(HEI).LT.VGUTA) HEI=CC
67AV2D(I)=DC4PLEX(AMR,AM1)
68AFM0(I)=DC4PLEX(AER,HEI)
69SUMR=CC0
70SUAE=CC0
71CFDET=CC0
7230 I=1,LEN
73AM=ANMC(I)
74AE=ALM0(I)
75GI=UGC(I,AM)
76GL=UGC(I,AE)
77SU1=SUME+GI*AM+GL*AE
78CFDET=CFDET+(CCAJG(^{I,ISA})*(AM-IHELP*AE)
79SU1E=SUME+GCMJG(^{I,ISA})*(AM+IHELP*AE)
80SCASEC=CR*DRKAL(SUME)
81TOTSEC=-CR*DRKAL(SUME)
82ACSSC=TOTSEC-SCASEC
83SAC(I,SA,ISA)=SU1E+CC0
84SAC(I,SA,ISA)=CFDET*CCN
85RETUR
86END

```

REPORT NO. - DSU/TIICCF LIBRARY FILE MAINTENANCE

REPORT NO. = 030110 FLCF 01 EASY FILE MAINTENANCE
 1.....1.....1.....1.....1.....1.....1.....1.....1.....1.....1.....

 1+111 (10,0) N12
 1+111 (10,0) N12,SECURE,MAXIT,0
 1+112 I112=-1
 1+113 K=1,I,012
 1+114 S(I)=1,J(N)
 1+115 IF (VOUT(1,0,0)) .GT. 17
 1+116 J=1,I,012
 1+117 J=1,I,012
 1+118 S(I)=S(I,J)
 1+119 S(I)=S(I,J)
 1+120 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+121 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+122 A(I,J)=0.1PLX(VIN(1,A(I)))
 1+123 I123=17
 1+124 I124=1,I,012
 1+125 A(I,J)=A(I,J)+A(J,J)*0.1
 1+126 A(I,J)=0.1PLX(VIN(1,A(I)))
 1+127 I127=1,I,012
 1+128 A(I,J)=A(I,J)
 1+129 A(I,J)=A(I,J)
 1+130 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+131 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+132 A(I,J)=0.1PLX(VIN(1,A(I)))
 1+133 I133=1,I,012
 1+134 J=1,I,012
 1+135 SET1=SET-A(I,J)+A(I,J)
 1+136 IF (VOUT(1,0,0)) .GT. 17
 1+137 SET1=SET1
 1+138 SET1=A(I,J)
 1+139 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+140 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+141 A(I,J)=SET1
 1+142 I142=17
 1+143 I143=1,I,012
 1+144 S(I,J)=S(I,J)+V(I,J)
 1+145 I145=1,I,012
 1+146 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+147 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+148 A(I,J)=SET1
 1+149 I149=1,I,012
 1+150 J=1,I,012
 1+151 S(I,J)=S(I,J)+V(I,J)
 1+152 I152=1,I,012
 1+153 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+154 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+155 A(I,J)=SET1
 1+156 I156=1,I,012
 1+157 J=1,I,012
 1+158 S(I,J)=S(I,J)+V(I,J)
 1+159 I159=1,I,012
 1+160 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+161 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+162 A(I,J)=SET1
 1+163 I163=1,I,012
 1+164 J=1,I,012
 1+165 S(I,J)=S(I,J)+V(I,J)
 1+166 I166=1,I,012
 1+167 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+168 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+169 A(I,J)=SET1
 1+170 I170=1,I,012
 1+171 J=1,I,012
 1+172 S(I,J)=S(I,J)+V(I,J)
 1+173 I173=1,I,012
 1+174 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+175 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+176 A(I,J)=SET1
 1+177 I177=1,I,012
 1+178 J=1,I,012
 1+179 S(I,J)=S(I,J)+V(I,J)
 1+180 I180=1,I,012
 1+181 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+182 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+183 A(I,J)=SET1
 1+184 I184=1,I,012
 1+185 J=1,I,012
 1+186 S(I,J)=S(I,J)+V(I,J)
 1+187 I187=1,I,012
 1+188 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+189 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+190 A(I,J)=SET1
 1+191 I191=1,I,012
 1+192 J=1,I,012
 1+193 S(I,J)=S(I,J)+V(I,J)
 1+194 I194=1,I,012
 1+195 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+196 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+197 A(I,J)=SET1
 1+198 I198=1,I,012
 1+199 J=1,I,012
 1+200 S(I,J)=S(I,J)+V(I,J)
 1+201 I201=1,I,012
 1+202 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+203 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+204 A(I,J)=SET1
 1+205 I205=1,I,012
 1+206 J=1,I,012
 1+207 S(I,J)=S(I,J)+V(I,J)
 1+208 I208=1,I,012
 1+209 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+210 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+211 A(I,J)=SET1
 1+212 I212=1,I,012
 1+213 J=1,I,012
 1+214 S(I,J)=S(I,J)+V(I,J)
 1+215 I215=1,I,012
 1+216 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+217 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+218 A(I,J)=SET1
 1+219 I219=1,I,012
 1+220 J=1,I,012
 1+221 S(I,J)=S(I,J)+V(I,J)
 1+222 I222=1,I,012
 1+223 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+224 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+225 A(I,J)=SET1
 1+226 I226=1,I,012
 1+227 J=1,I,012
 1+228 S(I,J)=S(I,J)+V(I,J)
 1+229 I229=1,I,012
 1+230 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+231 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+232 A(I,J)=SET1
 1+233 I233=1,I,012
 1+234 J=1,I,012
 1+235 S(I,J)=S(I,J)+V(I,J)
 1+236 I236=1,I,012
 1+237 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+238 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+239 A(I,J)=SET1
 1+240 I240=1,I,012
 1+241 J=1,I,012
 1+242 S(I,J)=S(I,J)+V(I,J)
 1+243 I243=1,I,012
 1+244 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+245 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+246 A(I,J)=SET1
 1+247 I247=1,I,012
 1+248 J=1,I,012
 1+249 S(I,J)=S(I,J)+V(I,J)
 1+250 I250=1,I,012
 1+251 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+252 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+253 A(I,J)=SET1
 1+254 I254=1,I,012
 1+255 J=1,I,012
 1+256 S(I,J)=S(I,J)+V(I,J)
 1+257 I257=1,I,012
 1+258 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+259 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+260 A(I,J)=SET1
 1+261 I261=1,I,012
 1+262 J=1,I,012
 1+263 S(I,J)=S(I,J)+V(I,J)
 1+264 I264=1,I,012
 1+265 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+266 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+267 A(I,J)=SET1
 1+268 I268=1,I,012
 1+269 J=1,I,012
 1+270 S(I,J)=S(I,J)+V(I,J)
 1+271 I271=1,I,012
 1+272 J=1,I,012
 1+273 S(I,J)=S(I,J)+V(I,J)
 1+274 I274=1,I,012
 1+275 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+276 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+277 A(I,J)=SET1
 1+278 I278=1,I,012
 1+279 J=1,I,012
 1+280 S(I,J)=S(I,J)+V(I,J)
 1+281 I281=1,I,012
 1+282 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+283 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+284 A(I,J)=SET1
 1+285 I285=1,I,012
 1+286 J=1,I,012
 1+287 S(I,J)=S(I,J)+V(I,J)
 1+288 I288=1,I,012
 1+289 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+290 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+291 A(I,J)=SET1
 1+292 I292=1,I,012
 1+293 J=1,I,012
 1+294 S(I,J)=S(I,J)+V(I,J)
 1+295 I295=1,I,012
 1+296 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+297 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+298 A(I,J)=SET1
 1+299 I299=1,I,012
 1+300 J=1,I,012
 1+301 S(I,J)=S(I,J)+V(I,J)
 1+302 I302=1,I,012
 1+303 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+304 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+305 A(I,J)=SET1
 1+306 I306=1,I,012
 1+307 J=1,I,012
 1+308 S(I,J)=S(I,J)+V(I,J)
 1+309 I309=1,I,012
 1+310 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+311 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+312 A(I,J)=SET1
 1+313 I313=1,I,012
 1+314 J=1,I,012
 1+315 S(I,J)=S(I,J)+V(I,J)
 1+316 I316=1,I,012
 1+317 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+318 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+319 A(I,J)=SET1
 1+320 I320=1,I,012
 1+321 J=1,I,012
 1+322 S(I,J)=S(I,J)+V(I,J)
 1+323 I323=1,I,012
 1+324 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+325 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+326 A(I,J)=SET1
 1+327 I327=1,I,012
 1+328 J=1,I,012
 1+329 S(I,J)=S(I,J)+V(I,J)
 1+330 I330=1,I,012
 1+331 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+332 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+333 A(I,J)=SET1
 1+334 I334=1,I,012
 1+335 J=1,I,012
 1+336 S(I,J)=S(I,J)+V(I,J)
 1+337 I337=1,I,012
 1+338 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+339 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+340 A(I,J)=SET1
 1+341 I341=1,I,012
 1+342 J=1,I,012
 1+343 S(I,J)=S(I,J)+V(I,J)
 1+344 I344=1,I,012
 1+345 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+346 IF (VOUT(1,0,0)).LT.VOUT(1,0,0) AND I=0
 1+347 A(I,J)=SET1
 1+348 I348=1,I,012
 1+349 J=1,I,012
 1+350 S(I,J)=S(I,J)+V(I,J)

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TABLE II IT-12000^a (z=1, -1, +1)

PRG 9.

CARD 13 (2E20.8)

CI Mixing factor for the iterative inversion of the T-matrix. The value CI=0.5 ensures good convergence.
TOL Tolerance of the inverted T-matrix. In practice $T^*T^{-1} \leq TOL$.
These quantities need be specified only when INVER=0.

CARD 14

VCUTM The elements of the T-matrix with magnitude smaller than this parameter are set to zero.
VCUTA The multipolar amplitudes of the scattered wave smaller than this value are set to zero.
VCUTN The multipolar amplitudes of the incident plane wave smaller than this value are set to zero.
The three quantities above are usually set to 1.0E-36, a value that prevents the occurrence of program interrupts due to underflow.

MAXIT	Number of the iterations if the T-matrix is to be inverted iteratively.
NFAC	Maximum value of the factorials to be used in the normalization factors.
JCK JCL }	Dimension of the vector of the Bessel functions.
<u>CARD 7</u>	(3E20.8) (NSPH card)
RXX(1) RYY(1) RZZ(1) }	Cartesian coordinates of the centre of the I-th sphere in the cluster.
<u>CARD 8</u>	(4012)
I0G(I)	This index specifies the type of the I-th sphere in the cluster. If I0G(I+1)=I0G(I) the program does not recalculate the T-matrices for the I+1-th sphere but assume they are identical to those of the I-th sphere.
<u>CARD 9</u>	(3E20.8)
R0S(I)	Radius of the I-th sphere.
<u>CARD 10</u>	(2E20.8) (NSPH card)
CRI(I)	Complex refractive index of the I-th sphere.
<u>CARD 11</u>	(E20.8, 2F10.4)
VK THK PHK }	Magnitude of the wavevector of the incident wave Polar angles (in Degrees) of the incident wavevector.
<u>CARD 12</u>	(315)
INVER	0 the T-matrix is inverted iteratively. 1 the T-matrix is inverted by LU factorization.
MODE	0, 1, 2, 3. This parameter provides the equilibration of the T-matrix in four different modes. The value MODE=3 has proved to be the most suitable for dielectric clusters far from resonance.
NDDMST	Maximum dimension of the T-matrix. <u>must</u> be equal to the dimension of the matrix AM.

PRG2 and PRG3

These programs were written at the CRDC by F.Borghese, P.Denti and R.Saija in order to handle relatively big clusters (see Table 1), even at the cost of increasing the CPU time. PRG3 differs from PRG2 in that it does not require the storage of the Clebsch-Gordan coefficients.

INPUT DESCRIPTION

Refer to DATASET TEST001.

CARD 1 (3A4)

IDATA
JDATA } These quantities identify the DATASET. They can be left
KDATA } blank if desired.

CARD 2 blank

CARD 3 (12)

NCAL Number of the group of data within the DATASET.

CARD 4 (40A4) (2 cards)

NAME This heading identifies the output. Any alphanumeric character can be used.

CARD 5 (412)

JGO
IWMA } These quantities control the input and output operations of PRG2 and PRG3. Their meaning is explained in
IWESS } the comment cards within the programs. Note that if JGO
IWCP } is put equal to 1 for all groups of data the programs run properly but for that they recompute matrices whose elements have still valid values.

CARD 6 (812) .

NSPH Number of the spheres in the cluster.

LMPO L_M+1

IHELP Helicity of the incident plane wave. Use +1 for right helicity and -1 for left helicity.

IEXP This quantity was originally introduced to control the convergency of the multipolar expansions.
Set it to 0.

DATE 1534 AUG 31 TIME 17:46:11
FILE C:\TEMP\COMPILE.DAT
STRUCTURE(77) NAMES(PS) FLAG(1) NAME(MAIN) LINECOUNT(85)
*****1.....2.....3.....4.....5.....6.....7.*....
1 COMPLEX FUNCTION CC01(Z,A,B,N,ISTEP)
2 COMPLEX Z,A(1),B(1)
3 CC01=Z
4 IF(1)=4,4,5
5 DO 1 J=1,N
6 CC01=CC01+A(1+(J-1)*ISTEP)*B(J)
7 RETURN
8 END
9
10# SOURCE STATEMENTS = 3, PROGRAM SIZE = 934 BYTES, PROGRAM NAME = CC01 PAGE
11# NO DIAGNOSTICS GENERATED.
12# CF COMPILATION IS *****

0 (MAY 1983)

VS FCKTKAN

DATE 1984 NOV 07 TIME 17 57

.......1.....2.....3.....4.....5.....6.....7. . .

7+ 20 VYH(IVT)=DCRNJG(YLM(IV))
75 IVY=IVY+LMTPCS
76 AKS=FR#VK
77 CALL RBF(LRG,LMT,JCK,FJ)
78 CALL RKF(LRG,LRT,FN)
79 NC 20 IV=1,LMTPC
80 IVT=IV+IVH3
81 25 VHF(IVT)=DCRPLX(FJ(IV),FAC(IV))
82 IVH3=IVH2+LMTPC
83 30 CONTINUE
84 IVY=0
85 IVH3=0
86 C=0.00
87 S=0.00,F=1,NSPH
88 X=-X(X,F)
89 Y=-HYY(X,F)
90 Z=-K2L(NF)
91 IF(RX,LX,CD,AND,RY,EQ,CD,AND,RZ,EQ,LC) GL TO 50
92 CALL POLAR(RX,RY,RZ,FR,CRTH,SRTH,CRPF,SRPF)
93 CALL SPHAR(CRTH,SRTH,CRPF,SRPF,LMTPC,YLM)
94 NC 40 IV=1,LMTPC
95 IVT=IV+IVY
96 40 VYJ(IVT)=JCCRNG(YLM(IV))
97 AKS=FR#VK
98 CALL RBF(LRG,LAT,JCK,FJ)
99 NC 40 IV=1,LMTPC
100 IVT=IV+IVH3
101 40 VJ(IVT)=FJ(IV)
102 IVY=IVY+LMTPC
103 IVH3=IVH2+LMTPC
104 NC 10
105 END

63.0 (MAY 1983) VS FORTRAN DATE 1984 NOV 07 TIME 1 50
 LIN. LBL. CT RELIST 642 ACCTRAN DCDSTNT NCODECK SOURCE TLEN OBJECT FILE
 15T(1) CARLEVEL(66) FILES FLAG(1) NAME(MAIN) LINECOUNT(1)

```

      .....1.....2.....3.....4.....5.....6.....7.

1      SUBROUTINE FUNCTION JH410(N,L,L1,Y1,L2,Y2)
2      IMPLICIT REAL*8(A-H,O-Z)
3      C=1.732050807568877540D-01,Y1(3)=22(3),YC0(3)=CHI(3),
4      Y0(3)=CHI(3),Y1(24)=Y1(243),Y0(24)=Y0(243)
5      C=(1+3)*C*(4+3),L1=L1+1,C=C*(1+3)
6      L1=(24+3)*L1+144,CHI(24)=S(24),YC0(24)=YC0(3)
7      C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
8      C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
9      C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
10     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
11     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
12     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
13     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
14     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
15     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
16     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
17     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
18     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
19     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
20     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
21     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
22     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
23     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
24     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
25     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
26     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
27     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
28     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
29     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
30     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
31     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
32     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
33     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
34     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
35     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
36     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
37     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
38     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
39     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
40     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
41     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
42     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
43     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
44     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
45     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
46     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
47     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
48     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
49     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
50     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
51     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
52     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
53     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
54     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
55     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
56     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
57     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
58     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
59     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
60     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
61     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
62     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
63     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
64     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
65     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)
66     C=C*(1+3)*L1+144,Y1(24)=Y1(243),Y0(24)=Y0(243)

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* 1984 NOV 07 17:03
 EFFECT NOLIST MAP AGREEE GOSTRT NCDECK SOURCE TEFM OBJECT FILE NOLIST
 (PTC) LANGUAGE(C6) NCFIPS FLAG(1) NAME(MAIN) LINECOUNT(65)
 3.....*...1.....*2.....*3.....*4.....*5.....*6.....*7.....*
 1 C00101 FUNCTION SPZ10(RFL,L1,M1,L2,N2)
 2 P2C101 LOCALS(A-B,(1-2))
 3 C001101 J00101 FXX(3),PYX(3),VZ7(3),VCS(3),VNL(3),
 4 VZG(3),VJ(27),VYH(24),VJ(27),VYJ(24)
 5 Z,EP(4,3),ISAS(1-2),ISAU(4,2),
 6 A(144),AE(124),AE(124),S(24),NAME(40),IC0101
 7 U(1-2),V(3-1),U(1-2),V(3-1),VYH,VYJ,V,SV,ISAS,ISAU,
 8 L1P101 INT(L1+L2+1),LM,LCM,L1+L2,L,N,M,N,IN,NSPH,LYTPU,LV1,LVTPU,
 9 L1P201 L1+L2+1,LCM,LCM,L1+L2,L,N,M,N,IN,NSPH,LYTPU,LV1,LVTPU,
 10 C001201 C01,C02,C03,C04,C05,C06,C07,C08,C09
 11 C001301 P1+P2+P3+P4+P5+P6+P7+P8+P9
 12 C001401 P1+P2+P3+P4+P5+P6+P7+P8+P9
 13 C001501 P1+P2+P3+P4+P5+P6+P7+P8+P9
 14 C001601 C1-C1-1
 15 C001701 C1-C1+1
 16 C001801 X1=148*(L2-L1)*L1+1
 17 C001901 X2=L2+1
 18 C002001 Y=(148*(L1+L1P0)*(L1+L1P0)*(L2+L2+1))/L1P0
 19 C002101 Z=148*(L1+L1P0)*L1+1
 20 C002201 IF((L1+L1P0)*(L1+L1P0)*(L2+L2+1)/L1P0<0) ISR=-1SN
 21 C002301 IF((L1+L1P0)*(L1+L1P0)*(L2+L2+1)/L1P0>0) ISR=1SN
 22 C002401 Y1=Y-1
 23 C002501 X1=148*(L1+L1P0)*L1+1
 24 C002601 X2=L2+1
 25 C002701 Y2=Y-1
 26 C002801 X1=148*(L1+L1P0)*L1+1
 27 C002901 X2=L2+1
 28 C003001 Y1=Y-1
 29 C003101 Y2=Y-1
 30 C003201 Y3=Y-1
 31 C003301 Y4=Y-1
 32 C003401 Y5=Y-1
 33 C003501 Y6=Y-1
 34 C003601 Y7=Y-1
 35 C003701 Y8=Y-1
 36 C003801 Y9=Y-1
 37 C003901 Y10=Y-1
 38 C004001 Y11=Y-1
 39 C004101 Y12=Y-1
 40 C004201 Y13=Y-1
 41 C004301 Y14=Y-1
 42 C004401 Y15=Y-1
 43 C004501 Y16=Y-1
 44 C004601 Y17=Y-1
 45 C004701 Y18=Y-1
 46 C004801 Y19=Y-1
 47 C004901 Y20=Y-1
 48 C005001 Y21=Y-1
 49 C005101 Y22=Y-1
 50 C005201 Y23=Y-1
 51 C005301 Y24=Y-1
 52 C005401 Y25=Y-1
 53 C005501 Y26=Y-1
 54 C005601 Y27=Y-1
 55 C005701 Y28=Y-1
 56 C005801 Y29=Y-1
 57 C005901 Y30=Y-1
 58 C006001 Y31=Y-1
 59 C006101 Y32=Y-1
 60 C006201 Y33=Y-1
 61 C006301 Y34=Y-1
 62 C006401 Y35=Y-1
 63 C006501 Y36=Y-1
 64 C006601 Y37=Y-1
 65 C006701 Y38=Y-1
 66 C006801 Y39=Y-1
 67 C006901 Y40=Y-1
 68 C007001 Y41=Y-1
 69 C007101 Y42=Y-1
 70 C007201 Y43=Y-1
 71 C007301 Y44=Y-1
 72 C007401 Y45=Y-1
 73 C007501 Y46=Y-1
 74 C007601 Y47=Y-1
 75 C007701 Y48=Y-1
 76 C007801 Y49=Y-1
 77 C007901 Y50=Y-1
 78 C008001 Y51=Y-1
 79 C008101 Y52=Y-1
 80 C008201 Y53=Y-1
 81 C008301 Y54=Y-1
 82 C008401 Y55=Y-1
 83 C008501 Y56=Y-1
 84 C008601 Y57=Y-1
 85 C008701 Y58=Y-1
 86 C008801 Y59=Y-1
 87 C008901 Y60=Y-1
 88 C009001 Y61=Y-1
 89 C009101 Y62=Y-1
 90 C009201 Y63=Y-1
 91 C009301 Y64=Y-1
 92 C009401 Y65=Y-1
 93 C009501 Y66=Y-1
 94 C009601 Y67=Y-1
 95 C009701 Y68=Y-1
 96 C009801 Y69=Y-1
 97 C009901 Y70=Y-1
 98 C0010001 Y71=Y-1
 99 C0010101 Y72=Y-1
 100 C0010201 Y73=Y-1
 101 C0010301 Y74=Y-1
 102 C0010401 Y75=Y-1
 103 C0010501 Y76=Y-1
 104 C0010601 Y77=Y-1
 105 C0010701 Y78=Y-1
 106 C0010801 Y79=Y-1
 107 C0010901 Y80=Y-1
 108 C0011001 Y81=Y-1
 109 C0011101 Y82=Y-1
 110 C0011201 Y83=Y-1
 111 C0011301 Y84=Y-1
 112 C0011401 Y85=Y-1
 113 C0011501 Y86=Y-1
 114 C0011601 Y87=Y-1
 115 C0011701 Y88=Y-1
 116 C0011801 Y89=Y-1
 117 C0011901 Y90=Y-1
 118 C0012001 Y91=Y-1
 119 C0012101 Y92=Y-1
 120 C0012201 Y93=Y-1
 121 C0012301 Y94=Y-1
 122 C0012401 Y95=Y-1
 123 C0012501 Y96=Y-1
 124 C0012601 Y97=Y-1
 125 C0012701 Y98=Y-1
 126 C0012801 Y99=Y-1
 127 C0012901 Y100=Y-1
 128 C0013001 Y101=Y-1
 129 C0013101 Y102=Y-1
 130 C0013201 Y103=Y-1
 131 C0013301 Y104=Y-1
 132 C0013401 Y105=Y-1
 133 C0013501 Y106=Y-1
 134 C0013601 Y107=Y-1
 135 C0013701 Y108=Y-1
 136 C0013801 Y109=Y-1
 137 C0013901 Y110=Y-1
 138 C0014001 Y111=Y-1
 139 C0014101 Y112=Y-1
 140 C0014201 Y113=Y-1
 141 C0014301 Y114=Y-1
 142 C0014401 Y115=Y-1
 143 C0014501 Y116=Y-1
 144 C0014601 Y117=Y-1
 145 C0014701 Y118=Y-1
 146 C0014801 Y119=Y-1
 147 C0014901 Y120=Y-1
 148 C0015001 Y121=Y-1
 149 C0015101 Y122=Y-1
 150 C0015201 Y123=Y-1
 151 C0015301 Y124=Y-1
 152 C0015401 Y125=Y-1
 153 C0015501 Y126=Y-1
 154 C0015601 Y127=Y-1
 155 C0015701 Y128=Y-1
 156 C0015801 Y129=Y-1
 157 C0015901 Y130=Y-1
 158 C0016001 Y131=Y-1
 159 C0016101 Y132=Y-1
 160 C0016201 Y133=Y-1
 161 C0016301 Y134=Y-1
 162 C0016401 Y135=Y-1
 163 C0016501 Y136=Y-1
 164 C0016601 Y137=Y-1
 165 C0016701 Y138=Y-1
 166 C0016801 Y139=Y-1
 167 C0016901 Y140=Y-1
 168 C0017001 Y141=Y-1
 169 C0017101 Y142=Y-1
 170 C0017201 Y143=Y-1
 171 C0017301 Y144=Y-1
 172 C0017401 Y145=Y-1
 173 C0017501 Y146=Y-1
 174 C0017601 Y147=Y-1
 175 C0017701 Y148=Y-1
 176 C0017801 Y149=Y-1
 177 C0017901 Y150=Y-1
 178 C0018001 Y151=Y-1
 179 C0018101 Y152=Y-1
 180 C0018201 Y153=Y-1
 181 C0018301 Y154=Y-1
 182 C0018401 Y155=Y-1
 183 C0018501 Y156=Y-1
 184 C0018601 Y157=Y-1
 185 C0018701 Y158=Y-1
 186 C0018801 Y159=Y-1
 187 C0018901 Y160=Y-1
 188 C0019001 Y161=Y-1
 189 C0019101 Y162=Y-1
 190 C0019201 Y163=Y-1
 191 C0019301 Y164=Y-1
 192 C0019401 Y165=Y-1
 193 C0019501 Y166=Y-1
 194 C0019601 Y167=Y-1
 195 C0019701 Y168=Y-1
 196 C0019801 Y169=Y-1
 197 C0019901 Y170=Y-1
 198 C0020001 Y171=Y-1
 199 C0020101 Y172=Y-1
 200 C0020201 Y173=Y-1
 201 C0020301 Y174=Y-1
 202 C0020401 Y175=Y-1
 203 C0020501 Y176=Y-1
 204 C0020601 Y177=Y-1
 205 C0020701 Y178=Y-1
 206 C0020801 Y179=Y-1
 207 C0020901 Y180=Y-1
 208 C0021001 Y181=Y-1
 209 C0021101 Y182=Y-1
 210 C0021201 Y183=Y-1
 211 C0021301 Y184=Y-1
 212 C0021401 Y185=Y-1
 213 C0021501 Y186=Y-1
 214 C0021601 Y187=Y-1
 215 C0021701 Y188=Y-1
 216 C0021801 Y189=Y-1
 217 C0021901 Y190=Y-1
 218 C0022001 Y191=Y-1
 219 C0022101 Y192=Y-1
 220 C0022201 Y193=Y-1
 221 C0022301 Y194=Y-1
 222 C0022401 Y195=Y-1
 223 C0022501 Y196=Y-1
 224 C0022601 Y197=Y-1
 225 C0022701 Y198=Y-1
 226 C0022801 Y199=Y-1
 227 C0022901 Y200=Y-1
 228 C0023001 Y201=Y-1
 229 C0023101 Y202=Y-1
 230 C0023201 Y203=Y-1
 231 C0023301 Y204=Y-1
 232 C0023401 Y205=Y-1
 233 C0023501 Y206=Y-1
 234 C0023601 Y207=Y-1
 235 C0023701 Y208=Y-1
 236 C0023801 Y209=Y-1
 237 C0023901 Y210=Y-1
 238 C0024001 Y211=Y-1
 239 C0024101 Y212=Y-1
 240 C0024201 Y213=Y-1
 241 C0024301 Y214=Y-1
 242 C0024401 Y215=Y-1
 243 C0024501 Y216=Y-1
 244 C0024601 Y217=Y-1
 245 C0024701 Y218=Y-1
 246 C0024801 Y219=Y-1
 247 C0024901 Y220=Y-1
 248 C0025001 Y221=Y-1
 249 C0025101 Y222=Y-1
 250 C0025201 Y223=Y-1
 251 C0025301 Y224=Y-1
 252 C0025401 Y225=Y-1
 253 C0025501 Y226=Y-1
 254 C0025601 Y227=Y-1
 255 C0025701 Y228=Y-1
 256 C0025801 Y229=Y-1
 257 C0025901 Y230=Y-1
 258 C0026001 Y231=Y-1
 259 C0026101 Y232=Y-1
 260 C0026201 Y233=Y-1
 261 C0026301 Y234=Y-1
 262 C0026401 Y235=Y-1
 263 C0026501 Y236=Y-1
 264 C0026601 Y237=Y-1
 265 C0026701 Y238=Y-1
 266 C0026801 Y239=Y-1
 267 C0026901 Y240=Y-1
 268 C0027001 Y241=Y-1
 269 C0027101 Y242=Y-1
 270 C0027201 Y243=Y-1
 271 C0027301 Y244=Y-1
 272 C0027401 Y245=Y-1
 273 C0027501 Y246=Y-1
 274 C0027601 Y247=Y-1
 275 C0027701 Y248=Y-1
 276 C0027801 Y249=Y-1
 277 C0027901 Y250=Y-1
 278 C0028001 Y251=Y-1
 279 C0028101 Y252=Y-1
 280 C0028201 Y253=Y-1
 281 C0028301 Y254=Y-1
 282 C0028401 Y255=Y-1
 283 C0028501 Y256=Y-1
 284 C0028601 Y257=Y-1
 285 C0028701 Y258=Y-1
 286 C0028801 Y259=Y-1
 287 C0028901 Y260=Y-1
 288 C0029001 Y261=Y-1
 289 C0029101 Y262=Y-1
 290 C0029201 Y263=Y-1
 291 C0029301 Y264=Y-1
 292 C0029401 Y265=Y-1
 293 C0029501 Y266=Y-1
 294 C0029601 Y267=Y-1
 295 C0029701 Y268=Y-1
 296 C0029801 Y269=Y-1
 297 C0029901 Y270=Y-1
 298 C0030001 Y271=Y-1
 299 C0030101 Y272=Y-1
 300 C0030201 Y273=Y-1
 301 C0030301 Y274=Y-1
 302 C0030401 Y275=Y-1
 303 C0030501 Y276=Y-1
 304 C0030601 Y277=Y-1
 305 C0030701 Y278=Y-1
 306 C0030801 Y279=Y-1
 307 C0030901 Y280=Y-1
 308 C0031001 Y281=Y-1
 309 C0031101 Y282=Y-1
 310 C0031201 Y283=Y-1
 311 C0031301 Y284=Y-1
 312 C0031401 Y285=Y-1
 313 C0031501 Y286=Y-1
 314 C0031601 Y287=Y-1
 315 C0031701 Y288=Y-1
 316 C0031801 Y289=Y-1
 317 C0031901 Y290=Y-1
 318 C0032001 Y291=Y-1
 319 C0032101 Y292=Y-1
 320 C0032201 Y293=Y-1
 321 C0032301 Y294=Y-1
 322 C0032401 Y295=Y-1
 323 C0032501 Y296=Y-1
 324 C0032601 Y297=Y-1
 325 C0032701 Y298=Y-1
 326 C0032801 Y299=Y-1
 327 C0032901 Y300=Y-1
 328 C0033001 Y301=Y-1
 329 C0033101 Y302=Y-1
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VS Full Train

LATE 1984 NCV C7

TIME 17

DATE 1964 NOV 07 TIME 17 08
 EFFECT ALFEST PAR_NEXREF SOURCE TERW OBJECT FILE
 P1(1) LNLSELV(66) ALFIPS FLAG(1) NAME(MAIN) LINECOUNT(65)

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(Var 1, 23)

VS ECE 153

DATE 1-23-86 V 97

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WINTER VEST WARMER GUSTAV REECK SOURCE TELM OBJECT FILED
JULY 1944 (C) 1944 (C) 1944 (C) 1944 (C) 1944 (C) 1944 (C)

(卷之三)

VS FIGURE.

DATE 1984 NOV 07

TIME 17 : 14

(DAY 15-3) VS FURMAN DATE 1964 NOV 07 TIME 17 : 16
EFECT VOLIST MAP DCEKED SUSINT NODECK BDFCCE TERN SUBJECT FIXED
CFT(1) LVSDEV(66) RCFPS FLAG(1) NAME(MAIN) LINECOUNT(35)

AY 12-3) VS FORTRAN DATE 1984 NOV 07 TIME 17:56:17
EDT DELIST MAP ASK-REF ALSTRT NO DECK SOURCE TERM OBJECT FIXED ACT
OPT(1) LANGLEVEL(1) MULIPS FLAG(1) NAME(MAIN) LINECOUNT(35)

L1,L2,L3,V1,V2,V3
 C1,C2,C3,N1,N2,N3,M,NSIM,NSPH,LMTPC,LNT,LMTPLS,
 L1=U1+(L1+1)+V1+1
 L2=U2+(L2+1)+V2+1
 L3=U3+(L3+1)+V3+1
 L1=L1+(L2+1)+(L3+1)+N+XW
 L2=L2+(L3+1)+N+XW
 L3=L3+N+XW

47 15083) VS FURMAN DATE 1964 NOV 07 TIME 17 : 16

B61 MUSI ST CIR NARLF 00511 00512 SOURCE 11** SUBJECT FIXED
MOT(1) CIR,SELE(1) 00513 FLAG(1) NAME(MAIN) EXECUTE(1)

.....1.....2.....3.....4.....5.....6.....7.....
S61 (J1+J2)*FACTC (J1,J2,J3,J4,J5,J6)
T62 (J1+J2+J3+J4+J5+J6+J7+J8+J9+J10+J11+J12+J13+J14+J15+J16+J17+J18+J19+J20+J21+J22+J23+J24+J25+J26+J27+J28+J29+J30+J31+J32+J33+J34+J35+J36+J37+J38+J39+J40+J41+J42+J43+J44+J45+J46+J47+J48+J49+J50+J51+J52+J53+J54+J55+J56+J57+J58+J59+J60+J61+J62+J63+J64+J65+J66+J67+J68+J69+J70+J71+J72+J73+J74+J75+J76+J77+J78+J79+J80+J81+J82+J83+J84+J85+J86+J87+J88+J89+J90+J91+J92+J93+J94+J95+J96+J97+J98+J99+J100+J101+J102+J103+J104+J105+J106+J107+J108+J109+J110+J111+J112+J113+J114+J115+J116+J117+J118+J119+J120+J121+J122+J123+J124+J125+J126+J127+J128+J129+J130+J131+J132+J133+J134+J135+J136+J137+J138+J139+J140+J141+J142+J143+J144+J145+J146+J147+J148+J149+J150+J151+J152+J153+J154+J155+J156+J157+J158+J159+J160+J161+J162+J163+J164+J165+J166+J167+J168+J169+J170+J171+J172+J173+J174+J175+J176+J177+J178+J179+J180+J181+J182+J183+J184+J185+J186+J187+J188+J189+J190+J191+J192+J193+J194+J195+J196+J197+J198+J199+J200+J201+J202+J203+J204+J205+J206+J207+J208+J209+J210+J211+J212+J213+J214+J215+J216+J217+J218+J219+J220+J221+J222+J223+J224+J225+J226+J227+J228+J229+J230+J231+J232+J233+J234+J235+J236+J237+J238+J239+J240+J241+J242+J243+J244+J245+J246+J247+J248+J249+J250+J251+J252+J253+J254+J255+J256+J257+J258+J259+J260+J261+J262+J263+J264+J265+J266+J267+J268+J269+J270+J271+J272+J273+J274+J275+J276+J277+J278+J279+J280+J281+J282+J283+J284+J285+J286+J287+J288+J289+J290+J291+J292+J293+J294+J295+J296+J297+J298+J299+J300+J301+J302+J303+J304+J305+J306+J307+J308+J309+J310+J311+J312+J313+J314+J315+J316+J317+J318+J319+J320+J321+J322+J323+J324+J325+J326+J327+J328+J329+J330+J331+J332+J333+J334+J335+J336+J337+J338+J339+J340+J341+J342+J343+J344+J345+J346+J347+J348+J349+J350+J351+J352+J353+J354+J355+J356+J357+J358+J359+J360+J361+J362+J363+J364+J365+J366+J367+J368+J369+J370+J371+J372+J373+J374+J375+J376+J377+J378+J379+J380+J381+J382+J383+J384+J385+J386+J387+J388+J389+J390+J391+J392+J393+J394+J395+J396+J397+J398+J399+J400+J401+J402+J403+J404+J405+J406+J407+J408+J409+J410+J411+J412+J413+J414+J415+J416+J417+J418+J419+J420+J421+J422+J423+J424+J425+J426+J427+J428+J429+J430+J431+J432+J433+J434+J435+J436+J437+J438+J439+J440+J441+J442+J443+J444+J445+J446+J447+J448+J449+J450+J451+J452+J453+J454+J455+J456+J457+J458+J459+J460+J461+J462+J463+J464+J465+J466+J467+J468+J469+J470+J471+J472+J473+J474+J475+J476+J477+J478+J479+J480+J481+J482+J483+J484+J485+J486+J487+J488+J489+J490+J491+J492+J493+J494+J495+J496+J497+J498+J499+J500+J501+J502+J503+J504+J505+J506+J507+J508+J509+J510+J511+J512+J513+J514+J515+J516+J517+J518+J519+J520+J521+J522+J523+J524+J525+J526+J527+J528+J529+J530+J531+J532+J533+J534+J535+J536+J537+J538+J539+J540+J541+J542+J543+J544+J545+J546+J547+J548+J549+J550+J551+J552+J553+J554+J555+J556+J557+J558+J559+J560+J561+J562+J563+J564+J565+J566+J567+J568+J569+J570+J571+J572+J573+J574+J575+J576+J577+J578+J579+J580+J581+J582+J583+J584+J585+J586+J587+J588+J589+J590+J591+J592+J593+J594+J595+J596+J597+J598+J599+J600+J601+J602+J603+J604+J605+J606+J607+J608+J609+J610+J611+J612+J613+J614+J615+J616+J617+J618+J619+J620+J621+J622+J623+J624+J625+J626+J627+J628+J629+J630+J631+J632+J633+J634+J635+J636+J637+J638+J639+J640+J641+J642+J643+J644+J645+J646+J647+J648+J649+J650+J651+J652+J653+J654+J655+J656+J657+J658+J659+J660+J661+J662+J663+J664+J665+J666+J667+J668+J669+J6610+J6611+J6612+J6613+J6614+J6615+J6616+J6617+J6618+J6619+J6620+J6621+J6622+J6623+J6624+J6625+J6626+J6627+J6628+J6629+J6630+J6631+J6632+J6633+J6634+J6635+J6636+J6637+J6638+J6639+J6640+J6641+J6642+J6643+J6644+J6645+J6646+J6647+J6648+J6649+J6650+J6651+J6652+J6653+J6654+J6655+J6656+J6657+J6658+J6659+J6660+J6661+J6662+J6663+J6664+J6665+J6666+J6667+J6668+J6669+J66610+J66611+J66612+J66613+J66614+J66615+J66616+J66617+J66618+J66619+J66620+J66621+J66622+J66623+J66624+J66625+J66626+J66627+J66628+J66629+J66630+J66631+J66632+J66633+J66634+J66635+J66636+J66637+J66638+J66639+J66640+J66641+J66642+J66643+J66644+J66645+J66646+J66647+J66648+J66649+J66650+J66651+J66652+J66653+J66654+J66655+J66656+J66657+J66658+J66659+J66660+J66661+J66662+J66663+J66664+J66665+J66666+J66667+J66668+J66669+J666610+J666611+J666612+J666613+J666614+J666615+J666616+J666617+J666618+J666619+J666620+J666621+J666622+J666623+J666624+J666625+J666626+J666627+J666628+J666629+J666630+J666631+J666632+J666633+J666634+J666635+J666636+J666637+J666638+J666639+J666640+J666641+J666642+J666643+J666644+J666645+J666646+J666647+J666648+J666649+J666650+J666651+J666652+J666653+J666654+J666655+J666656+J666657+J666658+J666659+J666660+J666661+J666662+J666663+J666664+J666665+J666666+J666667+J666668+J666669+J6666610+J6666611+J6666612+J6666613+J6666614+J6666615+J6666616+J6666617+J6666618+J6666619+J6666620+J6666621+J6666622+J6666623+J6666624+J6666625+J6666626+J6666627+J6666628+J6666629+J6666630+J6666631+J6666632+J6666633+J6666634+J6666635+J6666636+J6666637+J6666638+J6666639+J6666640+J6666641+J6666642+J6666643+J6666644+J6666645+J6666646+J6666647+J6666648+J6666649+J6666650+J6666651+J6666652+J6666653+J6666654+J6666655+J6666656+J6666657+J6666658+J6666659+J6666660+J6666661+J6666662+J6666663+J6666664+J666666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8+J66666666666639+J66666666666640+J66666666666641+J66666666666642+J66666666666643+J66666666666644+J66666666666645+J66666666666646+J66666666666647+J66666666666648+J66666666666649+J66666666666650+J66666666666651+J66666666666652+J66666666666653+J66666666666654+J66666666666655+J66666666666656+J66666666666657+J66666666666658+J66666666666659+J66666666666660+J66666666666661+J66666666666662+J66666666666663+J66666666666664+J66666666666665+J66666666666666+J66666666666667+J66666666666668+J66666666666669+J666666666666610+J666666666666611+J666666666666612+J666666666666613+J666666666666614+J666666666666615+J666666666666616+J666666666666617+J666666666666618+J666666666666619+J666666666666620+J666666666666621+J666666666666622+J666666666666623+J666666666666624+J666666666666625+J666666666666626+J666666666666627+J666666666666628+J666666666666629+J666666666666630+J666666666666631+J666666666666632+J666666666666633+J666666666666634+J666666666666635+J666666666666636+J666666666666637+J666666666666638+J666666666666639+J666666666666640+J666666666666641+J666666666666642+J666666666666643+J6666666666

MR 1943)

VS FORTRAN

DATE 1954 NOV 07

TIME 17 18

.....4...1.....2.....3.....4.....5.....6.....7.....

S(J4) =FACTL (JJ4)
S(J5) =FACTL (JJ5)*FACTL (JJ6)*FACTL (JJ7)
1*FACTL (JJ8)*FACTL (JJ9)*FACTL (JJ10)
S(J4) +=S(J5) 1*5*J4 3/5*J4 2
CL(J4)=S(J4)*FACTL (JJ4)

DO 10 J=1,10
10 CONTINUE

```

1 1982) VS FORTRAN DATE 1984 NOV 07 TIME 17 20
2 CT KINETIC MAP INCARER SUSINT NUCLOCK SOURCE TERM OBJECT FILE
3 OPT(1) ENLEVEL(CC) INCIPS FLAG(1) NAME(MAIN) LINENO(15)
4 .....1.....2.....3.....4.....5.....6.....7.....
5
6 SUBROUTINE FDR(X,N,JLN,FJ)
7 I=1,J=1,L=1,A=-1,C=-1
8 JLN=JL0
9 L=1,X=1.0D-017,II,II
10 I=1,J=1,II,II
11 C=1,I=1,J=1,II,II
12 C=1,I=1,J=1,II,II
13 C=1,I=1,J=1,II,II
14 C=1,I=1,J=1,II,II
15 C=1,I=1,J=1,II,II
16 C=1,I=1,J=1,II,II
17 C=1,I=1,J=1,II,II
18 C=1,I=1,J=1,II,II
19 C=1,I=1,J=1,II,II
20 C=1,I=1,J=1,II,II
21 C=1,I=1,J=1,II,II
22 C=1,I=1,J=1,II,II
23 C=1,I=1,J=1,II,II
24 C=1,I=1,J=1,II,II
25 C=1,I=1,J=1,II,II
26 C=1,I=1,J=1,II,II
27 C=1,I=1,J=1,II,II
28 C=1,I=1,J=1,II,II
29 C=1,I=1,J=1,II,II
30 C=1,I=1,J=1,II,II
31 C=1,I=1,J=1,II,II
32 C=1,I=1,J=1,II,II
33 C=1,I=1,J=1,II,II
34 C=1,I=1,J=1,II,II
35 C=1,I=1,J=1,II,II

```

1033

VS FORTRAN

DATE 1964 NOV 07

TIME 17 : 23

LIST CARDS FILE SOURCE TYPE OBJECT FIXED NO
OPT(1) DA,DEVLE(66) ACFTPS FLAG(1) NAME(MAIN) LINECOUNTED

....1.....2.....3.....4.....5.....6.....7.8...

```
200101 LINE 54 (X,L,FN)
200101 REAL*(N-N,L-2)
200101 FN(2)
200101 IF(X.LT.-.000.000.LT.0) RETURN
200101 I=I+1
200101 IF(X(1).LT.0.001) GO TO 20
200101 I=1+LFC
200101 X(1)=X(1)/X(1)
200101 X(2)=X(1)
200101 X(3)=X(2)
200101 IF(X(1).LT.0) RETURN
200101 I=1+2
200101 I=I+1
200101 I=I+1
200101 X(1)=X(1)+X(2)-X(3)
200101 X(2)=X(1)
```

1.931

VS FURT-HAN

DATE 1984 NOV 07

TIME 17:22:21

LIST (P) PAPERS (P) P-STAT (P) PGEN (P) SOURCE (P) TKEY (P) OBJECT (P) FIXE (P)

...S...1.....B.....S.....6.....7....

1. $\text{J}(x, y, z) = \text{J}(x, y, z, r, s)$
2. $\text{J}(x, y, z, r, s) = \text{J}(x-r, y-s)$
3. $\text{J}(x-r, y-s) = \text{J}(x-r, y-s, k, l, m, n, o, p)$
4. $\text{J}(x-r, y-s, k, l, m, n, o, p) = \text{J}(x-r, y-s, k, l, m, n, o, p, q)$
5. $\text{J}(x-r, y-s, k, l, m, n, o, p, q) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r)$
6. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s)$
7. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t)$
8. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u)$
9. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v)$
10. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w)$
11. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x)$
12. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y)$
13. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z)$
14. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r)$
15. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s)$
16. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t)$
17. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u)$
18. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v)$
19. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x)$
20. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y)$
21. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z)$
22. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r)$
23. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s)$
24. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t)$
25. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u)$
26. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v)$
27. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x)$
28. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y)$
29. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y, z)$
30. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y, z) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y, z, r)$
31. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y, z, r) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y, z, r, s)$
32. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y, z, r, s, t) = \text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u)$
33. $\text{J}(x-r, y-s, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v, x, y, z, r, s, t, u, v)$

I) VS FORTRAN DATE 1984 NOV 08 TIME 10 00 48

CLIST MAP NOXREF : GCSTMT NCDECK SOURCE TERM OBJECT FIXED NOTE
OPT(0) LANGLVL(66) NOFIPS FLAG(1) NAME(MAIN) LINECOUNT(85)

....1.....2.....3.....4.....5.....6.....7.*....

```
SUBROUTINE WLV
I(NHELP,TH,PH,LMPC)
IMPLICIT REAL*8(A-H,C-Z)
SI=1510.1 YLM(20)
CC1901/DU13/ RXX(3),RYY(3),RZZ(3),RGS(3),CRI(3),
VVR(27),VYH(243),VJ(27),VYJ(243)
,,-(4,3),S(4,3),TSAS(2,2),SAC(2,2),
3(24,2),AI(144),AF(1+-),AMM(1+-),AEM(24),S(24),NAME(40),IUG(3)
CCAPLEX#16 CRI,VF,VYF,VYJ,RV,SM,TSAS,SAC,
,A,I,AF,AVG,AEV,S
CC1901/DU95/FACTU(40),FNCRM(45)
CCAPLEX#16 YLM,AP,AV,AZ,CL
DATA P!/ 12.566370614356/
NL4P=LMPC+LMPC+1
YLW*(NL4P)=(C.000,C.000)
IHELP=1
IF(KHELP.EQ.2) IHELP=-1
P=-IHELP
CUST=CCST(TH)
SINT=CSIN(TH)
CCSP=CCOS(PH)
SI,P=CSIN(PH)
CALL SPHAN(CCST,SINT,CCSP,SINP,LMPC,YLM)
CLPH1=-CCST*CCS3
BETA1=-CUST*SINP
SI1=SI*P
ALPH2=SI1*P
BET12=-SI1*P
SI42=C*300
AP=.5*(DCPLX(ALPH1,P*ALPH2)+DCPLX(BETA1,P*BETA2)*(C.000,1.000))
A1=.5*(DCPLX(ALPH1,P*ALPH2)-DCPLX(BETA1,P*BETA2)*(C.000,1.000))
AZ=DCPLX(SA1,P*GAM2)
CL=CL*LF=2,LMPC
L=1
LFTL=LFT*L
X=LFTL
X=2*I*(C.000,1.000)+FL/DSQRT(X)
X=X+FL
I=-L
K=1
IF=1,V
I=I+1
N=LFTL+1
K=LFTL-1*(I+1)
XFT=LFTL-I*(K)
N=LFTL-1*(I-1)
X=DSQRT(X)
I=1
((X,K,IFLP)=DCPLX(A1*LP*YLM(K+2)+AP*CM*YLM(K)+AZ*CZ*YLM(K+1))+CL
,10
,10)
```

33) VS FORTRAN DATE 1984 NOV 08 TIME 10 00 45
ACLIST MAP NCXREF GCSTMT NCHECK SOURCE TERM OBJECT FIXED NOTE
CPT(0) LANGLVL(66) NCIPS FLAG(1) NAME(MAIN) LINECOUNT(85)

183) VS FORTRAN DATE 1984 NOV 08 TIME 10 00 42
 NOLIST MAP NOXREF GUSTMT NODECK SOURCE TERM OBJECT FIXED NCTE
 EST(0) LANGLVL(66) ACFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)
 ..*....1.....2.....3.....4.....5.....6.....7.*....
 SUBROUTINE SMAT
 IMPLICIT REAL*8(A-H,C-Z)
 CC 100/300/ RXX(3),RYY(3),RZZ(3),RCS(3),CRI(3),
 1 VH(27),VYH(243),VJ(27),VYJ(243)
 2 S(14,3),SM(4,3),TSAS(2,2),SAC(2,2),
 3 S(24,2),AI(144),AF(144),AMM(24),ADM(24),S(24),NAME(40),LOG(3)
 CC IPLEX#15 CH1,VH,VYH,VYJ,SM,TSAS,SAC,
 1 AMM,AF,AMM,ADM,S
 CC 20/30/30 15/24(144,144),DV(144),V(144)
 CC IPLEX#15 JV,3V
 CC MADM/INTLGM/LMPC,LV,NLV,NLMN,N,NM,NDIM,NSPH,LMTPC,LMT,LMTPCS,
 1 NSV,NMX,NMXS,NAN
 CC IPLEX#15 SH,SK,SSMSP,SEESP,CC0,CGH,CGK
 CC0=(0.000,0.000)
 L1=0
 DO 30 I1=1,NSPH
 30 L1=L1+1,LV
 35 SP=S1(L1,N1)
 36 SP=S1(L1,N1)
 L1TPC=L1+L1+1
 41=-L1-1
 DO 35 I1=1,L1TPC
 *1=V1+1
 I1=I1+1
 I2=0
 DO 23 I2=1,NSPH
 23 (I2,N1) GO TO 20
 20 J=1,VLVM
 I2=I2+1
 AM(11,I2)=CCC
 AM(11,I2+1)=CCC
 AM(11+N2,I2)=CCC
 1) AM(11+NM,I2+N2)=CCC
 25 I2=0
 26 L=L(CCD(N1,N2,NSPH))
 27 L2=1,L/
 L2TPC=L2+L2+1
 28 =-L2-1
 29 I2=1,L2TPC
 *2=V2+1
 I2=I2+1
 DO 23 I2=1,NSPH
 23 (I2,L1,L2,V1,L2,V2)
 24 =S<(I2,L1,L2,V1,L2,V2)
 25 (I1,I2)=CJM*SSMSP
 26 (I1,I2+1)=CJS*SSESP
 27 (I1+1,I2)=CJR*SSESP
 28 (I1+N2,I2+N2)=CJM*SSESP
 29 F=1.01(3115,0E15.0)
 27 J=1.01
 28 J=1.01
 29 J=1.01

1963) VS FORTRAN DATE 1984 NOV 08 TIME 10 00 39
 NCLIST MAP NCXREF GOSTMT NCDECK SCURCE TERM OBJECT FIXED NOTE
 CPT(0) LANGLVL(66) NCFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

...*...1.....2.....3.....4.....5.....6.....7.*....

```

SUBROUTINE CRCSSE
1(VK,IHELP,
2CASEC,ABSEC,TOTSEC,VOLTA)
3IMPLICIT REAL*3(A-H,L-Z)
CCMNC/DU40/RXX(3),YYY(3),RZZ(3),RCS(3),CRI(3),
1/VH(27),VYH(243),VJ(27),VYJ(243)
2,S4(4,3),S4(4,3),TSAS(2,2),SAC(2,2),
3,A124,2),AI(144),AF(144),AMMC(24),AE40(24),S(24),NAME(40),ICG(3)
COMPLEX*16 CRI,VH,VYH,VYJ,RM,SM,TSAS,SAC,
1,A1,AF,AM40,AE40,S
CCMNC/IATCCM/LVPL,LM,NLV,NLV,N,NM,NDIM,NSPH,LMTPC,LMT,LMTPCS,
1,N,XN,XS,XMAX
4COMPLEX*16 GIP,GLP,AM,AE,GI,GL,SUM1,SUME,CCO,CCCN,OFDET
5C=2.0D0
6CC=10.0DC,C.CCO)
7CR=.5/(VK*VK)
8CCM=-(.2.0C,1.0DC)*(.5*CR/VK)
IF(IHELP.EQ.-1) GO TO 10
1SA=1
2SA=2
3C TR 12
12 I1=C
4 L1=L1+1,LV
5 L1TPC=L1+L1+1
6 I1=-L1-1
7 I1=I1+1,L1TPC
8 I1=V1+1
9 I1=I1+1
10 I2=C
11 V=CC0
12 A2=CC0
13 I2=1,NSP+1
14 L2=L2+L2+1
15 I2=1,L2TPC
16 I2=V1+1
17 I2=I2+1
18 I2=C
19 V=A2(I2)
20 A2=AF(I2+1,V)
21 I2=GIP(L1,N1,N2,L2,V2)
22 I2=GLP(L1,N1,N2,L2,V2)
23 I2=SUMV+AM*GI+AE*GL
24 I2=SU1E+A2*GL+AE*GI
25 I2=SUMV
26 I2=SU1E
27 I2=AF(I2)=SU1E
IF(VOLTA.EQ.0) GO TO 27
28 I=1,NLV
30 AMR=DCREAL(AMMC(I))
31 AVI=DCIMAG(AMMC(I))
32 AER=DCREAL(AEMC(I))
33 AEI=DCIMAG(AEMC(I))
34 IF(DABS(AMR).LT.VOLTA) AMR=0.0
35 IF(DABS(AVI).LT.VOLTA) AVI=0.0
36 IF(DABS(AER).LT.VOLTA) AER=0.0
37 IF(DABS(AEI).LT.VOLTA) AEI=0.0
38 AMR1(I)=DC4PLX(AMR,AVI)
39 AVI1(I)=DC4PLX(AER,AEI)
40 AER1(I)=DC4PLX(AEI,AEI)
41 AEI1(I)=DC4PLX(AER,AVI)
42 I=1,NLV
43 AMR=DCREAL(AMMC(I))
44 AVI=DCIMAG(AMMC(I))
45 AER=DCREAL(AEMC(I))
46 AEI=DCIMAG(AEMC(I))
47 I1=SUMV+AM*GL+AE*GE
48 OFDET=OFDET+CCN*JG((I,ISA))+(A2-IHELP*AE)
49 GE=SU1E+DCN*JG((I,ISA))*(A2+IHELP*AE)
50 SAC=CR*DCREAL(SUMV)
51 TOTSEC=-CR*DCREAL(SUME)
52 GL=TFESCL-SCASEC
53 SAC(I1,ISA)=SU1E+CCN
54 SAC(ISA,ISA)=CFDET+CCCN

```

AT NC - CTSJUTIL ICCF LIBRARY FILE MAINTENANCE
5...1...15...20...25...30...35...40...45...50...55...60...65...70...75...30

RT NO. - UTSUTIL ICCF LIBRARY FILE MAINTENANCE
S...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80

PERIODIC - VISUAL LOGIC LIBRARY FILE MAINTENANCE

PRG 3

•C (MAY 1963) VS FORTRAN DATE 1984 NOV 07 TIME 17 34
EFFECT VOLIST MAP NEXXFF GSINT LDECK SOURCE TERM SUBJECT FILE
OPT(0) LANGLEV(66) CFIPS FLAG(1) NAME(MAIN) LINECOUNT(66)
.....1.....2.....3.....4.....5.....6.....7...

1 CPLEX FUNCTION FCPLEX(z,A,b,R,ISTEP)
2 CPLEX*10 z,A(1),B(1)
3 C I=2
4 C (N) +,0,
5 C : J=1,N
6 C I=0,J+1+(J-1)*ISTEP)+,J)
7 C
8 C

3.C (MAY 1983)

VS FURTHEAN

DATE 1984 NOV 07

TIME 17:31

*....3...1.....2.....3.....5.....6.....7.

70 431, A*(I,J,L)=C1&MP

432, C1,I,J,N

433, C1,I,J,N

434, I1:=1

435, I1,I,N

436, G(VCUT,I,J,3,3,3) RETURN

437, C1=(1,1,1,1,1,1)

438, I1,I,N

439, C1,I,J,N I=1,J

440, C1,I,J,N J=1,I

441, C1,I,J,N (I,J)

442, C1,I,J,N L(I,J,I)

443, C1,I,J,N L(I,J,I)

444, F(AA*(I,J,3,3,3)+B*(I,J,3,3,3),G1,T,L) G1 TL 6250

445, F(AA*(I,J,3,3,3)+B*(I,J,3,3,3),G1,T,L) G1 TL 6250

446, C1,I,J,N

447, C1,I,J,N I=I+1

448, C1,I,J,N I=I+1

449, A*(I,J)=D1*D2*(C1,F,I)

450, C1,I,J,N

451, C1,I,J,N

452, C1,I,J,N

1 (ARY 1983)

VS FORTRAN

DATE 1984 NOV 07

TIME 17 56 17

```

*.....1.....2.....3.....4.....5.....6.....7.....
10 PLMS(J)=(3*X*SPLMS(K)-C*PLMS(V))/A
11 (L-L')37,21,31
12 L=L+1
13 J=L
14 L=3
15 J=(L+(L+1))/L+2
16 K=L-1
17 M=L-1
18 L=L
19 K=J-1
20 J=J-L+1
21 PLMS(J)=(3*X*SPLMS(K)-C*(L-M)*PLMS(M))/A
22 (L-L')37,21,31
23 L=L+1
24 J=L
25 L=1
26 J=L=(L+(L+1))/L+1
27 J=L+1,L+M+1
28 K=J-1
29 L=M-1
30 M=M
31 L=L
32 K=J
33 J=L
34 L=L*(L+1)
35 J=L+1,L+M+1
36 K=J-1
37 L=M-1
38 M=M
39 L=L
40 K=J
41 J=L
42 L=L*(L+1)
43 J=L+1,L+M+1
44 L=L*(L+1)/2+1
45 J=L
46 Y=J*(L-V2)=Y1*(1-2*WAVE)+PLMS(WAVE)
47 J=L+1
48 J=L+1,J
49 J=L*(L+1)*(L+1)*L+M*S(J)
50 J=L+1
51 Y=J*(L-V2)=52*V2+50*CPLX(COSKMP(YA), SINRMP(YA))
52 (L-J-1)*10.0E-3)YLNRS(1A)=-YLNRS(1A)
53 L=L*(L-V2)
54 Y=J*(L-V2)=52*V2+50*CPLX(COSRPP(YA), -SINRMP(YA))
55 (L-1)*10.0E-3)YLNRS(1A)
56 J=L+1
57 J=L
58 L=L+1
59 J=L-41
60 J=L-41
61 J=L-41
62 J=L

```

(SAY 1503)

VS FORTRAN

DATE 1984 NOV 07

TIME 17 20 47

(MAY 1983)

VS FORTRAN

DATE 1984 NOV 08 TIME 10 00 51

EFFECT NCLIST MAP NOXREF GOSTMT NODECK SOURCE TERM OBJECT FIXED NOTE
 OPT(0) LANGLVL(66) NCFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

.......1.....2.....3.....4.....5.....6.....7.*....

```

1      SUBROUTINE RSM
2          (LMPC,NGRMX,VK,JCL)
3      IMPLICIT REAL*8(A-H,C-Z)
4      CCVMCN/DUMD/ RXX(3),RYY(3),RZZ(3),RCS(3),CRI(3),
5      VVH(27),VYH(243),VJ(27),VYJ(243)
6      2,R1(4,3),SM(4,3),TSAS(2,2),SAC(2,2),
7      3A(24,2),AI(144),AMM(144),AC(24),S(24),NAME(40),IOG(3)
8      CCAPLEX#16 CRI,VF,VYH,VYJ,SV,TSAS,SAC,
9      1A,AI,AF,AMMC,AEMC,S
10     DIMENSION
11     LCFJ(100),FN(7),FJ(100)
12     COMPLEX#16 CFJ,CRII,VKN,DCFJ,A,B,C,D
13     LM=LMPC-1
14     LMPT=LMPC+1
15     DO 20 I=1,NGRMX
16     ICGI=ICG(I)+1
17     IF(ICGI.GT.1) GO TO 6
18     ICGI=ICGI-1
19     5  L=1,LM
20     SM(L,I)=SM(L,ICGI)
21     DO 20 I=20
22     VKR=VK*RCS(I)
23     CRII=CRI(I)
24     VRK=VKR*CRII
25     CRII=CRII+CRII
26     IF(DIVAS(VRK).EQ.0.000) GO TO 7
27     CALL CBF(VRK,LMPC,JCL,CFJ,IIR)
28     IF(IIR.EQ.0) STOP
29     GO TO 5
30     VKR=0.0E0
31     CALL RBF(VVKR,LMPC,JCL,FJ,IIR)
32     IF(IIR.EQ.1) STOP
33     CFJ(J)=FJ(J)
34     CALL RBF(VVKR,LMPC,JCL,FJ,IIR)
35     IF(IIR.EQ.1) STOP
36     CALL RNF(VVK,LMPC,FN)
37     LD=2,LMPC
38     LD=1
39     LD=LD+L
40     LDPC=LD+1
41     AF=(L*FJ(L)-LD*FN(LDPCL))
42     DFJ=(L*FJ(L)-LD*FJ(LDPCL))
43     DCFJ=(L*CFJ(L)-LD*CFJ(LDPCL))
44     A=CFJ(L)*(VKR*DFN+FN(LD)+E)
45     B=VKR*DCEJ+CFJ(LD)*E
46     C=CFJ(L)*(VKR*DFJ+FJ(LD)*E)
47     D=FJ(LD)*B
48     E=FN(LD)*C
49     RA(L,I)=1.000/(1.000+(C*E00;1.000)+(A-E)/(CRII*C-D)))
50     RB(L,I)=1.000/(1.000+(C*E00;1.000)+(A-E)/(CRII*C-D)))
51     END,TRN
52     RETURN
53     END

```

(MAY 1983) VS FORTRAN DATE 1984 NOV 08 TIME 10 00 53
 EFFECT NBLIST MAP NCXREF GOSTMTC NCDECK SOURCE TERM OBJECT FIXED NOTE
 UPT(0) LANGLVL(60) NCFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

.......1.....2.....3.....4.....5.....6.....7.*....

```

SUBROUTINE AUXIL
10 NFAC,JCK,JSC,VK)
11 IMPLICIT REAL*8(A-H,C-Z)
12 DIMENSION YLM(61),FJ(100),FN(3)
13 COMPLEX*16 YLM
14 CCMEN/DCMD/ RXX(3),RYY(3),RZZ(3),RCS(3),CRI(3),
15 VY(27),VYH(243),VJ(27),VYJ(243)
16 S1(4,3),S1(4,3),TSAS(2,2),SAC(2,2),
17 S(24,2),-I(144),AF(144),AMNC(24),AEAC(24),S(24),NAME(40),ICG(3)
18 COMPLEX*16 CRI,VF,VYH,VYJ,RY,SY,TSAS,SAC,
19 AI,AF,AMNC,AEAC,S
20 CCMEN/DCMD/FACTC(40),FNCRM(45)
21 CCMEN/VINFCEN/LMPC,LM,NLM,NLVM,N,NM,NDIM,NSPH,LMTPC,LMT,LMTPCS,
22 NSYC,NMX,NMXS,NMXN
23 DATA PI4/ 12.566370614356/
24 IF(JSC.GE.1) GO TO 18
25 L=L*PC-1
26 NL=LMPC+LMPC
27 NLV=NLM-1
28 N=NSPH+NLV
29 N=N-NSPH
30 NMV=NM+NM
31 LTPU=LAPC+LMPC-1
32 L*TPCS=L*TPU+LMTPC
33 K=NSPH-1
34 K=L*PC+L*PC+LMPC
35 NMXS=NMX+NMX
36 NMV=NMX+NMX
37 FACTC(L)=1.0D0
38 12 I=2,NFAC
39 I=I-1
40 FACTC(I)=A*FACTC(I-1)
41 15 LF=1,LMTPC
42 LF=1
43 LTPU=LF+L
44 IS IM=1,LF
45 I=I-1
46 V=LF-V
47 LPV=LF+V
48 K=L*PC/2+14
49 =LTPU*FACTC(LMX)/FACTC(LPV)
50 =V/PIN
51 A=A*(A)=RT(A)
52 IF(JSC.GT.2) RETURN
53 IVY=0
54 IV=0
55 32 NF=1,NSPH
56 NF=NF+1
57 33 NS=NMPC,NSPH
58 RX=RXX(NS)-RXX(NF)
59 RY=RYY(NS)-RYY(NF)
60 RZ=RZZ(NS)-RZZ(NF)
61 CALL POLAR(RX,RY,RZ,RR,CPTH,SRTH,CRPH,SRPH)
62 CALL SPHA2(CRTH,SRTH,CRPH,SRPH,LMTPC,YLM)
63 20 IV=1,LMTPCS
64 IVT=IV+IVY
65 IV+(IVT)=DCCAJG(YLM(IV))
66 IVY=IVY+LMTPC
67 JCK=PI4*VK
68 CALL RKF(4K5,LMT,JCK,FJ,TIR)
69 T(II-1,EJ,1) STOP
70 CALL JNF(4K5,LVT,FN)
71 25 IV=1,LMTPC
72 IVT=IV+IVH
73 IV+(IVT)=DCCAFLX(FJ(IV),FN(IV))
74 IVH=IVH+LMTPC
75 37 TI=0
76 IVY=0
77 IV=0
78 38 I=0,100
79 39 NF=1,NSPH
80 RX=-RXX(NF)
81 RY=-RYY(NF)
82 RZ=-RZZ(NF)
83 IF(RX.CA.0.AND.RY.EQ.0.AND.RZ.EQ.0) GO TO 50
84 CALL POLAR(RX,RY,RZ,RR,CPTH,SRTH,CRPH,SRPH)

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.......1.....2.....3.....4.....5.....6.....7.*....

50 IVT=IV+IVY
40 VYJ(IVT)=DCCNJG(YLM(IV))
45 ARS=RRE*VK
CALL RBF(ARG,LMT,JCK,FJ,IIR)
IF(IIR.EQ.1) STOP
50 IV=1,LMTPC
IVT=IV+IVH3
45 VJ(IVT)=FJ(IV)
52 IVY=IVY+LMTPC
55 IVH3=IVH3+LMTPC
RETURN
END

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EFFECT NOLIST MAP NCXREF GCSTAT NCDECK SOURCE TERM OBJECT FIXED NOTE
 UPT(0) LANGLVL(66) NDFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

.......1.....2.....3.....4.....5.....6.....7.*....

```

COMPLEX FUNCTION GH*16(NBL,L1,M1,L2,M2)
IMPLICIT REAL*8(A-H,C-Z)
CL1404/DC107 RAX(3),RYY(3),RZZ(3),ROS(3),CRI(3),
IVH(27),VYH(243),VJ(27),VYJ(243)
2,R(4,3),SM(4,3),ISAS(2,2),SAC(2,2),
3a(24,2),AI(144),AF(144),AMM(24),ACM(24),S(24),NAME(40),ICG(3)
COMPLEX*16 CRI,VH,VYH,VYJ,RM,SM,ISAS,SAC,
1,I,J,AF,AMM,AEMO,S
CCIPLEX/INTCUM/LMPC,LM,NLM,NLMM,N,NM,NDIM,NSPH,LMPD,LMT,LMPDS,
1NSPC,NMX,NMXS,NMAX
CCIPLEX*16 CSLA,CCC,CFUN
DATA PI4/12.566370014356/
CD=(0.0DC,0.0DC)
GH=CCC
L1PO=L1+1
L1NP0=IABS(L2-L1)+1
LMAXPC=L2+L1PO
CX=P14*(L1+L1PO)*(L2+L2+1)
CCR=DSQRT(CR)
ISN=1
IF(L2.GT.L1.AND.MOD(LMINAPC,2).EQ.0) ISN=-ISN
IF(MOD(M2,2).NE.0) ISN=-ISN
IF(NBL.LT.0) GO TO 22
NBL4=NBL-1
GO TO 23
22 NBL4=-NBL-1
NBR=NBLMC*LMTPC
NCY=NBLMC*LMTPUS
CD(5)=J4=1,3
CSUM4=CD0
NCU=J4-2
MUPM1=MU+41
MUPM2=MU+42
IF(MUPM1.LT.-L1.CP.+MUPM1.GT.-L1.CR.+MUPM2.LT.-L2.CR.+MUPM2.GT.-L2)
1 GO TO 50
JSN=ISN
CGC1=CLGC(1,L1,L1,-40,MUPM1,M1)
CGC2=CLGC(1,L2,L2,-MU,MUPM2,M2)
CR=CGC1*CGC2
2555 F=134T(311),6E15,e
CD(4)=LT=L'MAPC,LMAXPC,2
L3=L7-1
A17M2=A1-12
IF(A17M2.LT.-L3.OK.+M1M2.GT.-L3) GL TO 40
NY=L3*L3+LT+Y1*M2
AL3=LT
CGC3=CLGC(L2,L1,L3,C,C,C)
CGC4=CLGC(L2,L1,L3,YUPM2,-YUPM1,M2-M1)
CFUN=J3N*V1(NBH+LT)*VYH(NPY+NY)*CGC3*CGC4/DSERT(ACRS)
IF(NBL.GT.0) GO TO 30
IF(MOD(L3,2).NE.0) CFUN=-CFUN
35 CSUM=CSUM+CFUN
40 JSN=-JSN
CSUM=CSUM+CR
IF(MOD(L3,2).NE.0) CSUM=-CSUM
50 CR=CR+CGC1
CF=CR*CCR
RETURN
END

```

1 (MAY 1983) VS FORTRAN DATE 1984 NOV 08 TIME 10 00 59
 EFFECT NOLIST MAP NOXREF GCSTMT NODECK SOURCE TERM OBJECT FIXED NCT
 OPT(0) LANGLVL(66) NCFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

.....1.....2.....3.....4.....5.....6.....7.....
 1 COMPLEX FUNCTION GK*16(NBL,L1,M1,L2,M2)
 2 IMPLICIT REAL*8(A-H,L-Z)
 3 CCMU17/0617/ RXA(3),RYA(3),RZZ(3),RCS(3),CRI(3),
 4 1VH(27),VYH(243),VJ(27),VYJ(243),
 5 2,R1(4,3),S1(4,3),TSAS(2,2),SAC(2,2),
 6 SW(24,2),AI(144),AF(144),AMMO(24),AEYC(24),S(24),NAME(40),IDG(3)
 7 CC1PLEX*16 CRI,VFH,VYH,VYJ,RM,SM,TSAS,SAC,
 8 LN,AI,AF,AMMO,AEYC,S
 9 CC14001/1.1TCOM/LMPC,LM,NLM,NLMM,N,NM,NDIM,NSPH,LMPG,LMT,LMTPCS,
 10 LNS,NMX,NMXS,NMXN
 11 CC1PLEX*16 CCR,CSUV,CCC,CCI,CFUN
 12 DATA PI/12.56637814356/
 13 CCO=(0.000,0.000)
 14 CCI=(0.000,1.000)
 15 GK=CCO
 16 L1MG=L1-1
 17 L1PC=L1+1
 18 LMINPC=IABS(L2-L1MC)+1
 19 LYAXPC=L2+L1
 20 CR=P1*(L1+L1MG)*(L1+L1PC)*(L2+L2+1)/L1PC
 21 CCR=CS.RT(CR)*CCI
 22 ISN=1
 23 IF(L2.GT.L1MC.AND.MOD(LMINPC,2).EQ.0) ISN=-ISN
 24 IF(ACRS(42,2).NE.0) ISN=-ISN
 25 IF(NBL.LT.0) GO TO 22
 26 NBLMG=NBL-1
 27 GO TO 23
 28 NBLMG=-NBL-1
 29 NBR=NBLMG*LMPG
 30 NY=NBLMG*LMPCS
 31 JY=1,3
 32 CSUM=CCO
 33 AL=J4-2
 34 JUPM1=1J+41
 35 JUPM2=40+42
 36 IF(JUPM1.LT.-L1*CO.CK.MUPM1.GT.L1MC.OR.MUPM2.LT.-L2.CR.MUPM2.GT.L2)
 37 GO TO 50
 38 JSN=ISN
 39 CSU1=CLGG(1,L1MC,L1,-VU,VUPV1,V1)
 40 CSU2=CLGG(1,L2,L2,-VU,VUPV2,M2)
 41 CX=CGC1*CGC2
 42 DU=+D LT=L1MC,VU,LYAXPC,2
 43 L3=L1-1
 44 JV2=J1-12
 45 IF(M1142.LT.-L3.CR.V1**2.GT.L3) GO TO 40
 46 NY=L3*L3+LT+*IM42
 47 ACRS=L3+LT
 48 CGC3=CLGG(L2,L1MC,L3,C,C,C)
 49 CGC4=CLGG(L2,L1MC,L3,VUPM2,-MUPM1,M2-11)
 50 CFJ=JSN*VH(RPH+LT)*VYH(NBY+NY)*CGC3*CGC4/DSQRT(ACRS)
 51 NN2F=NPH+LT
 52 NN3Y=NBY+NY
 53 IF(1,BL,LT,0) GO TO 35
 54 IF(MOD(L3,2).NE.0) CFUN=-CFUN
 55 CSUV=CSUV+CFUN
 56 JSN=-JSN
 57 CSUM=CSUV*CF
 58 IF(MU.NE.0) CSUM=-CSUM
 59 GK=GK+CSUV
 60 GK=GK*CK
 61 RETURN
 END

AY 1983) VS FORTRAN DATE 1984 NOV 08 TIME 10 01 02
 ECT NCLIST MAP NCXREF GOSIMT NCDECK SOURCE TERM OBJECT FIXED NCTES
 CPT(0) LANGLVL(66) NCIPS FLAG(I) NAME(MAIN) LINECOUNT(85)
1.....2.....3.....4.....5.....6.....7......
 COMPLEX FUNCTION GIM*L6(N1,L1,M1,L2,M2)
 IMPLICIT REAL*8(LA-F,C-Z)
 UC4*CN/DUM/RXX(3),RYY(3),RZZ(3),RCS(3),CRI(3),
 1VH(27),VYH(243),VJ(27),VYJ(243),
 2,S(4,3),SM(4,3),TSAS(2,2),SAC(2,2),
 3A(24,2),AI(144),AF(144),AVG(24),AEMC(24),S(24),NAME(40),LOG(3)
 CC*PLEX#16 CRI,VH,VYH,VYJ,RM,SM,TSAS,SAC,
 1M,AI,AF,AVG,AEMC,S
 UC4*CN/INTCOM/L1PC,LM,ALM,ALMM,N,AM,ADIM,ASPH,LMTPC,LMT,LMTPCS,
 1NS,NS,NMX,NMX,NMX
 CC*PLEX#16 CSUM,CC,CFUN
 DATA PI/12.566370014350/
 C00=(2.000,0.000)
 GI=CC0
 UC=CC0
 IF(RXX(N1).EQ.C0.AND.RYY(N1).EQ.CC.AND.RZZ(N1).EQ.C0) GC TC 6C
 L1P=L1+1
 LMINPC=IAQS(L2-L1)+1
 LMAXPC=L2+L1PC
 CR=PI*(L1+L1PC)*(L2+L2+1)
 CC2=CS*RT(CR)
 ISN=1
 IF(L2.GT.L1.AND.MU(LMINPC,2).EQ.0) ISN=-ISN
 IF(MU(JY2,2).NE.0) ISN=-ISN
 N1NG=N1-1
 N3J=N1VG#LMTPC
 N3Y=N1VU#LMTPCS
 UC5D(J)=1,3
 CSUM=CC0
 JU=J-2
 IUPV1=JU+1
 IUPV2=JU+2
 IF(VUPV1.LT.-L1.CR.VUPV1.GT.L1.CR.VUPV2.LT.-L2.CR.VUPV2.GT.L2)
 1GS, TC 5D
 JSN=ISN
 UC61=ULG0(I,L1,L1,-MU,VUPV1,V1)
 UC62=ULG0(I,L2,L2,-MU,VUPV2,V2)
 C1=UC61*UC62
 UC4=LT=LMINPC,LMAXPC,2
 L3=L7-1
 L1L2=L1-M2
 IF(L1L2.LT.-L3.CR.MIVV2.GT.L3) GC TC 4C
 NY=L3+L3+LT+VIVV2
 ACSS=L3+LT
 CGC3=CLG0(L2,L1,L3,C,2,0)
 UC64=ULG0(L2,L1,L3,VUPV2,-VUPV1,V2-V1)
 CFJN=JSN*VJ(NB0+LT)*VYJ(NBY+NY)*UC63*CGC4/DSQRT(ACRS)
 CSUM=CSU1+CFUN
 4C JSN=-JSN
 CSU1=CSU1*CR
 IF(VU.NE.0) CSU4=-CSUM
 GI1=GI1+CSUM
 GI1=GI1*CCR
 RETURN
 5C IF(L1.E1).L2.AND.V1.E1.V2) GIM=(1.000,0.000)
 RETURN
 5C

1963)

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T AC LIST MAP NOXREF GOSTMT NCDECK SOURCE TERM OBJECT FIXED NCTEST
 CPT(0) LANGLVL(66) NOFIPS FLAG(I) NAME(MAIN) LINECOUNT(85) CF

....*...1.....2.....3.....4.....5.....6.....7.*.....

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CCPLEX FUNCTION GLM*16(N1,L1,M1,L2,M2)
1PLICIT REAL*8(A-F,C-Z)
CCV2C/NJUMS/RXX(3),RYY(3),RZZ(3),RCS(3),CR1(3),
1V=(27),VYH(243),VJ(27),VYJ(243),
2,F(4,3),SM(4,3),TSAS(2,2),SAC(2,2),
3n(24,2),AI(144),AF(144),AMMC(24),AEMC(24),S(24),NAME(40),ICG(3)
CCPLEX*16 CR1,VF,VYH,VYJ,RM,SV,TSAS,SAC,
1n,4I,4F,4MCS,AEMC,S
CCV2C/INTCOM/LMPC,LM,NLM,NLMN,N,AM,ADIM,NSPH,LMTPC,LMT,LMTPCS,
1NS,4C,NMX,NMXS,NMXV
CCPLEX*16 CCR,CSUM,CCC,CCI,CFUN
DATA PI4/12.566375814356/
CCD=(0.000,0.000)
CL=CCD
CC=C*CCD
IF(RAX(N1).EQ.CC.AND.RYY(N1).EQ.CC.AND.RZZ(N1).EQ.CC) RETURN
CC1=(0.333,1.000)
L1*C=L1-1
L1*D=L1+1
L1*E=IAS(L2-L1*C)+1
L1*F=L2+L1
CC=PI4*(L1+L1*D)*(L1+L1*E)*(L2+L2+F)/L1*F
CC=DSQRT(CR)*CCI
ISN=1
IF(L2.GT.L1MC.AND.MCD(LMINPC,2).EQ.0) ISN=-ISN
IF(MCD(M2,2).NE.0) ISN=-ISN
N1*C=N1-1
N1*D=N1+C
N1*E=N1*D+LMTPC
N1*F=N1*D+LMTPCS
N1*G=1,3
N1*H=CCD
N1*I=J-2
N1*J=N1+I
N1*K=N1+J
N1*L=N1+K
IF(N1*J.LT.-L1MC.CR.*VUPM1.GT.L1MC.JR.*VUPM2.LT.-L2.CR.*VUPM2.GT.-L2)
130 N1*J=ISN
N1*J=ISN
N1*J=GLGC(L1,L1MC,L1,-MU,MUPM1,M1)
N1*J=GLGC(L1,L2,L2,-MU,VUPM2,V2)
N1*J=GLGC(L1*L1MC,L1*M1,M1)
N1*J=LT=LMINPC,LVAXPC,2
L1=L1-1
N1*J=J-12
N1*J=J-12
N1*J=J-12.LT.-L3.CR.*V1M2.GT.L3) GC TC +0
N1*J=L3+LT+V1M2
N1*J=L3+LT
N1*J=GLGC(L2,L1MC,L3,C,C)
N1*J=GLGC(L2,L1MC,L3,VUPM2,-VUPM1,M2-M1)
N1*J=ISN*VJ(N3J+LT)*VYJ(N3Y+NYY)*CCC*CCD/DSQRT(ACRS)
CCD=CSUM+CFUN
40 JSN=-JSN
CCD=CSUM+CCR
IF(N1.NE.0) CSUM=-CSUM
50 CL=GLM+CSUM
CL=GLM+CCR
END

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1983)

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CT NOLIST MAP NOXREF GOSTMT NODECK SOURCE TERM OBJECT FIXED NOTES
 OPT(0) LANGLEV(66) NOFIPS FLAG(1) NAME(MAIN) LINECOUNT(65)

F....*....1.....2.....3.....4.....5.....6.....7.*.....

```

COMPLEX FUNCTION GIP#16(L1,M1,N2,L2,M2)
IMPLICIT REAL*8(A-H,C-Z)
CC*4,V/DUMD/RXX(3),RYY(3),RZZ(3),RCS(3),CRI(3),
1V=(27),VYH(243),VJ(27),VYJ(243)
2,X(4,3),S(4,3),TSAS(2,2),SAC(2,2),
3A(24,2),AI(144),AF(144),AMM(24),AE(40,24),S(24),NAME(40),ICG(3)
COMPLEX#16 CRI,VH,VYH,VYJ,KV,SV,TSAS,SAC,
1W,AI,AF,AMM,C,AE,M,S
COMPLEX#INTCCM/LMPC,LM,NLM,NLMM,N,NM,NDIM,NSPH,LMTPL,LMT,LMTPCS,
1:S(40),VX,NAXS,NMAXN
COMPLEX#16 CSUM,CCC,CFUN
DATA PI/3.141592653589793238462643383279502884197169399375105824113227429190295183775196152792586476921049726541933143567
CCC=(0.0DC,0.0DC)
GIP=CCC
CC=CCC
IF(L1.EQ.0) GO TO 60
L1PC=L1+1
LMINPC=IABS(L2-L1)+1
LMAXPC=L2+L1PC
CC=PI*(L1+L1PC)*(L2+L2+1)
CC=CS*CRT(CR)
IS=1
IF(L2.GT.L1.AND.VCD(LMINPC,2).EQ.0) ISN=-ISN
IF(VCD(12,2).NE.0) ISN=-ISN
NY=1
NM=V2-1
NM=V2*CM*LMTPC
NM=NM*CM*LMTPCS
NM=NM*CM
NM=1,3
CSJM=CCC
VJ=JV-2
VU1=VU+M1
VU2=VU+M2
IF(VUPM1.LT.-L1.CR.+VUPM1.GT.L1.CR.+VUPM2.LT.-L2.CR.+VUPM2.GT.L2)
1000 GO TO 50
ISN=ISN
CGC1=CLGC(1,L1,L1,-MU,VUPM1,V1)
CGC2=CLGC(1,L2,L2,-MU,VUPM2,V2)
CGC1=CGC1*CGC2
CGC1=CGC1*LT=LMINPC,LMAXPL,2
LT=LT-1
V1*V2=V1-V2
IF((V1*V2.LT.-LT).OR.(11*V2.LT.LT)) GO TO 40
VY=LT+LT+V1*V2
LT=LT+LT
CGC3=CLGC(1,L2,L1,L3,C,J,C)
CGC4=CLGC(1,L2,L1,L3,MU,V2,-VUPM1,M2-V1)
UFJ=ISN*VJ*(NMJ+LT)*VYJ*(NYBY+NY)*CGC3*CGC4/DSCRT(ALRS)
IF(VCG(12,2).NE.0) CFUN=-CFUN
CSJM=CSUM+CFUN
40 ISN=-ISN
CSJM=CSJM*CR
IF((VU.NE.0) CSUM=-CSUM
50 GIP=GIP+CSJM
GIP=GIP*CR
550
60 IF(L1.EQ.L2.AND.M1.EQ.M2) GIP=(1.0DC,0.0DC)
RETUR
END

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1983)

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NOLIST	MAP NOXREF	GCSTMT NODECK	SOURCE TERM	OBJECT FIXED	NOTE
OPT(0)	LANGLVL(66)	NCFIPS	FLAG(I)	NAME(MAIN)	LINECOUNT(85)

....*....1.....2.....3.....4.....5.....6.....7.*....

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CCPLEX FUNCTION GLP*16(L1,M1,N2,L2,M2)
IMPLICIT REAL*8(A-H,C-Z)
CC4C(N/DUM0/RXX(3),RYY(3),RCS(3),CRI(3),
1VH(27),VYH(243),VJ(27),VYJ(243)
2,R4(4,3),SM(4,3),TSAS(2,2),SAC(2,2),
3W(2+,2),AI(144),AF(144),AMMO(24),AEMC(24),S(24),NAME(40),ICG(3)
CCPLEX*16 CRI,VH,VYH,VYJ,KM,SM,TSAS,SAC,
1o,AI,AF,AMMC,AEMC,S
CC4C(N/TCUM/LMPU,LN,NLM,NLMM,N,NM,NDIM,NSPH,LMTPO,LMT,LMTPCS,
1NS4L,NMX,NMXS,NMXM
CCPLEX*16 CCP,CSUM,CCO,CCI,CFUN
DATA PI4/12.566370614356/
CCD=(0.000,C.000)
GLP=CCO
CC=C.000
IF(RXX(N2).EQ.C0.AND.RYY(N2).EQ.CC.AND.RZZ(N2).EQ.CD) RETURN
CCI=(C.000,1.CCD)
L1YC=L1-1
L1PC=L1+1
LMINPC=IABS(L2-L1MC)+1
LMAXPC=L2+L1
CR=PI4*(L1+L1MC)*(L1+L1PC)*(L2+L2+1)/L1PC
CC=DSQRT(CR)*CCI
ISN=1
IF(L2.LT.L1MC.AND.MOD(LMINPC,2).EQ.0) ISN=-ISN
IF(MOD(N2,2).NE.0) ISN=-ISN
N2YC=N2-1
N2J=N2YC*LMTPC
N2Y=N2YC*LMTPCS
N2SC JM=1,3
CSUM=CCD
YL=JM-2
YU=YU+Y1
YU=YU+Y2
IF(YUPM1.LT.-L14C.CR.YUPM1.GT.L1MC.CR.YUPM2.LT.-L2.CR.YUPM2.GT.L2)
185 T=50
JSN=ISN
CGC1=CLGC(1,L1MC,L1,-YL,YUPM1,M1)
CGC2=CLGC(1,L2,L2,-YL,YUPM2,M2)
CG=CGC1*CGC2
CG=CG*LT=LMINPC,LMAXPC,2
L3=LT-1
M1=M2=M1-M2
If(M1.M2.LT.-L3.CR.M1.M2.GT.L3) GC TC 40
YY=L3*L3+LT+Y1*Y2
ACRS=L3+LT
CGC3=CLGC(L2,L14C,L3,0,0,0)
CGC4=CLGC(L2,L14C,L3,YUPY2,-YUPY1,Y2-Y1)
CF(J)=JSN+VJ(N3J+LT)*VYJ(NBY+YY)*CGC3*CGC4/DSQRT(ACKS)
IF(MOD(L3,2).NE.0) CFUN=-CFUN
CSUM=CSUM+CFUN
+2 JSN=-JSN
CSUM=JSN*4*CF
IF(MU.NE.0) CSUM=-CSUM
+3 GLP=GLP+CSUM
GLP=GLP+CFUN
RETURN
END

```

33) VS FORTRAN DATE 1984 NOV 08 TIME 10 01 12
'NOLIST MAP NOXREF GCSTMT NODECK SOURCE TERM OBJECT FIXED NOTES
OPT(0) LANGLVL(66) NOFIPS FLAG(I) NAME(MAIN) LINECOUNT(65) C
.*****1.....2.....3.....4.....5.....6.....7.*.....
FUNCTION ACCU(N1,N2,N)
IF(N1.GT.N2) GO TO 20
NF=N1
NG=N2
ISY=0
GO TO 30
DO NF=N2
NS=N1
ISY=1
DO NCOL=NS-NF
NF1=NF-1
IF (NF1.EQ.0) GO TO 50
JCJU=0
DO I=1,NF1
JCJU=JCJU+I
NCOL=NCOL+NFMC*N-JCEL
IF (ISY.EQ.1) NCOL=-NCOL
NCOL=0
END

83) VS FORTRAN DATE 1984 NOV 08 TIME 10 01 13
 *NOLIST MAP NOXREF GOCTMT NCDECK SOURCE TERM OBJECT FIXED NOTES
 OPT(0) LANGLVL(66) NCFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)
 .*...1.....2.....3.....4.....5.....6.....7.*....
 REAL FUNCTION CLGC*8(JA,JB,JC,MA,MB,MC)
 IMPLICIT REAL*8(A-H,C-Z)
 CC14C1/CC35/FACTC(40),FNCRM(45)
 IF(MA-JA)4,4,3
 CLG0=0.000
 GCTC35
 IF(MA+JA)5,6,6
 CLG0=C.000
 GCTC35
 IF(MA-JB)3,8,7
 CLG0=C.000
 GCTC35
 IF(MA+JB)9,10,10
 CLG0=0.000
 GCTC35
 IF(MA-JC)12,12,11
 CLG0=0.000
 GCTC35
 IF(MA+JC)13,14,14
 CLG0=0.000
 GCTC35
 IF(JC-JA-JB)15,15,15
 CLG0=0.000
 GCTC35
 JJ1=JA+JC-JB+1
 JJ2=JC+JA-JB+1
 JJ3=JC-JA+JB+1
 JJ4=JC+JA+JB+2
 JJ5=JA+MA+1
 JJ6=JA-MA+1
 JJ7=JB+MA+1
 JJ8=JB-MA+1
 JJ9=JC+MA+1
 JJ10=JC-MA+1
 JJ11=-JC+JB-MA
 JJ12=-JC+JA+JB
 JJ13=JA+JB-JC
 JJ14=JA-MA
 JJ15=JA+MA
 IF(JJ17)17,17,20
 IF(JJ18)18,18,19
 K=0
 GCTC24
 K=JJ13
 GCTC24
 IF(JJ18)21,21,22
 K=JJ17
 GCTC24
 IF(JJ17-JJ18)19,19,21
 IF(JJ21-JJ19)25,25,26
 IF(JJ19-JJ20)23,23,27
 K=JJ11
 GCTC25
 K=JJ13
 GCTC25
 IF(JJ21-JJ20)25,25,26
 K=JJ21
 GCTC25
 I=K
 IF(K-24.(K/2))31,32,31
 CLY=1.000
 GCTC32
 CLY=-1.000
 JJ11=I+1
 JJ12=JJ1-I
 JJ13=JJ5-I
 JJ14=JJ7-I
 JJ15=JJ-C-A+I+1
 JJ16=JJ-C-B+I+1
 P=CLY=FACTC (JJ11)*FACTC (JJ12)*FACTC (JJ13)
 1=FACTC (JJ14)*FACTC (JJ15)*FACTC (JJ16)
 S=CLY+CLY/PRODU
 IF(I-K)33,34,34
 I=I+1
 CLY=-CLY
 GCTC32
 ARG=2*JC+1

33) VS FORTRAN DATE 1984 NOV 03 TIME 10 01 13

.*....1.....2.....3.....4.....5.....6.....7.*....

```
SQUA 2=FACTC (JJ4)
SQUA 3=FACTC (JJ5)*FACTC (JJ6)*FACTC (JJ7)
1*FACTC (JJ3)*FACTC (JJ5)*FACTC (JJ10)
SQUA 4=SQUA 1*SQUA 3/SQUA 2
CLGC=SQ1*DSQRT(SQ1A 4)
RETURN
END
```

3) VS FORTRAN DATE 1984 NOV 08 TIME 10 01 16
 VLIST MAP ACXREF GUSTMT NODECK SOURCE TERM OBJECT FIXED NOTE
 OPT(0) LANGLVL(06) NOFIPS FLAG(1) NAME(MAIN) LINECOUNT(85)

```
*...1.....2.....3.....4.....5.....6.....7.*....  

SUBROUTINE RBF(X,N,JCK,FJ,IIR)  

IMPLICIT REAL*3(A-H,C-Z)  

DIMENSION FJ(100)  

IIR=0  

JCK=JCK  

IF(X-1.0D-3)7,11,11  

FJ(1)=1.  

IF(N)10,10,8  

N=N+1  

JCK=N=2,MM  

FJ(1)=C,  

30 T0 33  

FNC=1.24*X+C*5  

TST=+.21*+.342*44819*DLCG(X)+3.  

IF(.2-TST)13,12,12  

DELTAT=2.  

30 T0 14  

DELTAT=TST  

FN=,  

IF(FN-FNC)15,15,16  

FN=FN+DELTAT  

30 T0 17  

FJ(1)=FN+DELTAT  

N=N+1.  

JCK=N+2  

IF(JCK-JCK)21,21,13  

IIS=1  

30 T0 24  

FJ(NS+1)=0.  

FJ(NS)=1.0D-45  

NS=NS-1  

FX=FX-1  

FJ(1)=(7.4*FX+3.)/X+FJ(N+1)-FJ(N+2)  

IF(.2435*(FJ(1))-1.0D+43)23,33,33  

IF(.1-1)<0,25,24  

X=X-1  

N=N-1  

30 T0 22  

IF(.1-.2)30,27,27  

CS=CS*X  

CSX=CS*X  

CS=CS*CS*X  

FX=1.-N/5.0+XXXX/120.-X6/50+0.  

CS=FJ(1)/SER  

JJ=1  

30 T0 31  

SER=SER*(X)  

IF(.2435(SER)-.1)20,29,29  

IF(X-.11)<0,29,30  

CS=CS*(FJ(1)/SER)  

JJ=1  

30 T0 31  

FJ(1)=CS*(FJ(1)/SER)  

FJ(1)=FJ(1)/CS  

CS=CS*(FJ(2)/(SER/X-DLG(X)))  

JJ=2  

N=N+1  

30 T0 32 N=JJ,12  

FJ(1)=FJ(N)/CS  

30 T0 30  

JJ=JJ+1  

30 T0 31 J=JJ,15  

FJ(1)=FJ(J)*1.0-45  

30 T0 32  

JJ=JJ+1  

30 T0 31
```

VS FORTRAN

DATE 1984 NOV 08 TIME 10 01 18

LIST MAP ACXREF GUSTHT NCDECK SOURCE TERM OBJECT FIXED NOTES
OPT(0) LANGLEV(66) NCFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

..1.....2.....3.....4.....5.....6.....7.*.....

```
ROUTINE RNF(X,L,FN)
      REAL*8(A-H,L-Z)
      DIMENSION FN(9)
      IF(X.LT.0.0000.R.EQ.L.LT.0) RETURN
      P=L+1
      F(X,P,T.0.000) GO TO 20
10   I=1,LPU
      S(I)=-1.00+50
      RETURN
      X1=-DCOS(X)/X
      X2=(F,I-DSIN(X))/X
      X(1)=FN1
      X(2)=FN2
      F(L,L+2) RETURN
      I=1.00/X
      J=L-1
      30  I=1,LPU
      IPU=I+I+1
      PT=I+2
      D=F,I
      X1=FN2
      X2=FN1*X1*IPU-FAC
      X(IPU)=FN2
      RETURN
      END
```

AD-R158 #57

THE OPTICAL SPECTRA OF AEROSOLS(U) MESSINA UNIV (ITALY) 2/2
IST DI STRUTTURA DELLA MATERIA F BORGHESE FEB 85
R/D-4103-EN DAJA37-81-C-0895

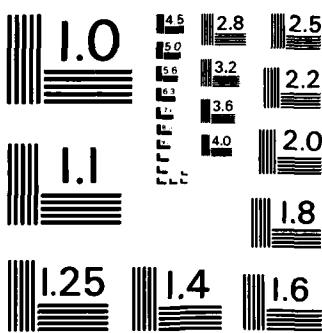
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TIME 10 1 19

IN EFFECT NOLIST MAP NOXREF GLSTMT NODECK SOURCE TERM OBJECT FIXED
OPT(0) LANGLEV(66) NCFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

```
*.....1.....2.....3.....4.....5.....6.....7.*.

1      SUBROUTINE CBF(X,N,JCK,FJ,IIR)
2      IMPLICIT REAL*8(A-H,E-Z)
3      DIMENSION FJ(100)
4      CC48LEX*16 FJ,X,XX,XXXX,XE,SER,CCN,CCN1
5      IJK=7
6      Y=CD13S(X)
7      IJK=JCK
8      IF(Y-1.0D-6)7,11,11
9      FJ(1)=1.
10     IF(1)11,10,8
11     MV=N+1
12     DO 8 V=2,MV
13     FJ(1)=0.
14     RETURN
15     FNC=1.04*Y+6.5
16     TST=4.21*CDL12(Y)+3.
17     IF(2.-TST)13,12,12
18     DELTA=2.
19     17,14
20     DELTA=TST
21     FJ=1
22     IF(FJ,-FJ,C)15,15,16
23     FJ=FNC+DELT
24     SU T 17
25     FJ,V,S=FJ,+DELT
26     N5=N5+1.
27     ICK=N5+2
28     IF(ICK-JCK)21,21,10
29     IIR=1
30     RETURN
31     FJ(V+1)=-
32     FJ(V)=(1.0D-37,1.0D-37)
33     V=V-1
34     FJ(V)=((FJ(V+3.)/X)*FJ(V+1)-FJ(V+2)
35     IF(CDLS(FJ(V))-1.033)23,33,33
36     F(V-1)25,25,24
37     V=V-1
38     FJ=FJ-V-1.
39     SU T 22
40     25 IF(Y-.32)26,27,27
41     XX=X*X
42     XX(X=X*X-X
43     XC=XXX*X-X
44     SEK=1.-XX/6.+XXXX/120.-XE/5040.
45     CC1=FJ(1)/SER
46     JJ=1
47     SU T 31
48     SE=-COSIN(X)
49     IF(CDLS(SEF)-.1)28,29,29
50     IF(Y-.11)29,29,30
51     CC1=X*FJ(1)/SER
52     JJ=1
53     SU T 31
54     CC1,X=FJ(1)/SER
55     FJ(1)=FJ(1)/CCN1
56     CC1=X*FJ(2)/(SER/X-CDLS(X))
57     JJ=2
58     MV=MV+1
59     DC 32 N=JJ,MV
60     FJ(N)=FJ(M)/CCV
61     RETURN
62     JJ=MV+1
63     DC 34 J=JJ,N5
64     FJ(J)=FJ(J)*1.0D-33
65     DC T 22
66     END
```

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EFFECT NOLIST MAP NOXREF GCSTMT NCDECK SOURCE TERM OBJECT FIXED NOTES
OPT(0) LANGLVL(66) NUFIPS FLAG(I) NAME(MAIN) LINECOUNT(85) C

........1.....2.....3.....4.....5.....6.....7.*.....

SUBROUTINE POLAR(X,Y,Z,R,CTH,STH,CPH,SPH)

IMPLICIT REAL*8(A-H,C-Z)

RHC=X*X+Y*Y

IF(RHC.GT.0.000) GO TO 10

CPH=1.0DC

SPH=0.0DO

R=SQRT(Z)

IF(R.GT.C.0DC) GO TO 15

CTH=1.0DC

STH=0.0DO

RETURN

10 R=DSQRT(RHC+Z*Z)

XHC=DSQRT(RHC)

CPH=X/RHC

SPH=Y/RHC

15 CTH=Z/R

STH=XHC/R

RETURN

END

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EFFECT ACLIST MAP NCXREF GCSTMT NCDECK SOURCE TERM OBJECT FIXED NOTE
 UPT(0) LANGLVL(66) NOFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

.......1.....2.....3.....4.....5.....6.....7.*....

SUBROUTINE SPHAR

```

1 IMPLICIT REAL*8 (A-H,C-Z) SINRTH,CCSRPH,SINRPH,LMPG,YLJRS
2 DIMENSION SINRMP(9),CCSRMP(9),PLMRS(45),YLJRS(81)
3 CC44CN/DUMG/FACTC(40),FNCKM(45)
4 CPLEX*16 YLJRS
5 L4=L4P0-1
6 SINRMP(1)=0.000
7 CCSRMP(1)=1.000
8 SINRMP(2)=SINRPH
9 CCSRMP(2)=CCSRPH
10 IF(L4P0-2)3,3,6
11 DC 7 J=3,LMPG
12 K=J-1
13 SI,F4D(J)=SINRPH*CCSRMP(K)+CCSRPH*SINRMP(K)
14 CCSRMP(J)=CCSRPH*CCSFMP(K)-SINRPH*SINRMP(K)
15 CONTINUE
16 X=CCSRTH
17 XA=0.0005(X)
18 Y=DX3S(SINRTH)
19 IF(XA-1.00-6)4,9,18
20 L=0
21 LAVE=(L*(L+1))/2+1
22 TAVE=2.000*L
23 V=0
24 K=L+V
25 IF(K-2*(K/2))12,13,12
26 J=LAVE+V
27 PL4RS(J)=0.000
28 TO 14
29 I4=X+1
30 I2=K/2+1
31 JC=(L-V)/2
32 IC=JC+1
33 J=L1AVE+V
34 PL4RS(J)=((-1)**JC)*FACTC(I1)/(TAVE*FACTC(IC)*FACTC(IC))
35 IF(L-L1)15,16,16
36 V=V+1
37 J=L+V
38 IF(L-L1)11,17,40,+7
39 L=L+1
40 JC=J-1
41 PL4RS(J)=0.000
42 IF(L-L1)28,19,19
43 PL4RS(1)=1.000
44 PL4RS(2)=X
45 L=2
46 J=(L*(L+1))/2+1
47 A=L
48 B=2*L-1
49 C=L-1
50 K=J-L
51 V=J-L**L+1
52 PL4RS(J)=(B*X*PLMRS(K)-C*PLMRS(V))/A
53 IF(L-L1)21,22,22
54 L=L+1
55 JC TO 20
56 L=1
57 V=1
58 L=L+V
59 J=(L*(L+1))/2+1
60 JC=V+1
61 PL4RS(J)=0.000
62 IF(L-L1)25,26,25
63 V=V+1
64 JC TO 24
65 IF(L-L1)27,40,40
66 L=L+1
67 JC=V+1
68 PL4RS(1)=1.000
69 PL4RS(2)=X
70 PL4RS(3)=Y
71 PL4RS(5)=3.000*Y*X
72 L=L
73 J=(L*(L+1))/2+1
74 A=L
75 B=2*L-1
76 C=L-1

```

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```

*....*...1.....2.....3.....4.....5.....6.....7.*.....
PLMRS(J)=(B*X*PLMRS(K)-C*PLMRS(M))/A
IF(L-LM)30,31,31
30 L=L+1
GC TC 29
31 L=3
32 J=(L*(L+1))/2+2
A=L-1
B=2*L-1
C=L
K=J-L
V=J-2*L+1
PLMRS(J)=(B*X*PLMRS(K)-C*PLMRS(V))/A
IF(L-LM) 33,34,34
33 L=L+1
GC TD 32
34 L=2
35 A=1
LAve=(L*(L+1))/2+1
36 J=LAve+V+1
K=J-1
L=K-1
EAT=V
A=(2.000*EAT*X)/Y
B=(V+L)*(L-V+1)
PLMRS(J)=4*PLMRS(K)-B*PLMRS(N)
IF((A+1-L) 37,38,38
37 A=1+1
GC TD 36
38 IF(L-L) 39,40,40
39 L=L+1
GC TC 35
40 CONTINUE
L=2
41 J=3
LAve=L*(L+1)
LAve=K*AVE+1
AVE=K*AVE/2+1
42 IF(J) 44,43,43
43 YLUFS(J,LAve)=FLURS(VAVE)*PLMRS(PAVE)
GC TC 45
44 JA=LAve+J
SAVE=FLURS(JA)*PLMRS(JA)
45 JA=J+1
IA=LAve+J
YLUFS(IA)=SAVE*DUMPLX(COSH(P(VA)), SINH(P(VA)))
IF(A>0)(J,2)*N=0)YLUFS(IA)=-YLUFS(IA)
IA=LAve-J
46 YLUFS(IA)=SAVE*DUMPLX(COSH(P(VA)), -SINH(P(VA)))
IF(J-L) 46,47,47
47 J=J+1
GC T 46
48 IF(L-LM) 48,49,49
49 L=L+1
GC T 41
50 CONTINUE
51 RETURN
END

```

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FFECT NCLIST MAP NCXREF GCSTMT NODECK SOURCE TERM C8JECT FIXED NOTECH
 UPT() LANGLVL(66) NOFIPS FLAG(I) NAME(MAIN) LINECOUNT(85)

.......1.....2.....3.....4.....5.....6.....7.*.....

SUBROUTINE CSMINV(AM,V,NODMST,N,MCDE,IER,VCUT)

14PLICIT REAL*8 (A-H,O-Z)
 DIMENSION AM(NODMST,1),V(1)
 CCAPLEX*16 AM,DET,C SUM,CTEMP,C DOT
 DATA CCNST/3.55271367380C5D-17/
 IER=0

KMINUS=N-1

PTEST = (4.0CC*CCNST*N)**2

1200 IF(N.NE.1) GC TO 1300

DET=AM(1,1)

IF(DABS(DREAL(DET))+DABS(DIMAG(DET)) .EQ. 0.0D0) GC TO 5200

AV(1,1) = (1.0CC,C.0CC)/DET

RETURN

1300 DO 1309 I=1,N

SUM=0.0D0

DO 1319 J=1,N

SUM = SUM +DREAL(AM(I,J))**2 +DIMAG(AM(I,J))**2

CONTINUE

V(I)=1.0CC/SUM

1309 CONTINUE

DET=1.0D0

DO 2019 K=1,N

KPLUS=K+1

KMINUS=K-1

L=K

PSJMAX=0.0DC

DO 2029 I=K,N

CTEMP = -CDOT(-AM(I,K),AM(I,1),AM(1,K),KMINUS,NODMST)

A(I,K)=CTEMP

PSJ = V(I)*(DREAL(CTEMP)**2 +DIMAG(CTEMP)**2)

IF(PSJ.LE.PSJMAX) GC TO 2029

PSJMAX=PSJ

L=I

CONTINUE

VTEMP=V(K)

IF(L.GE.K) GC TO 2011

DO 2049 J=1,N

CTEMP=A(I,J)

A(I,J)=AM(L,J)

AM(L,J)=CTEMP

2049 CONTINUE

CTEMP=V(L)

V(L)=V(K)

DET=-DET

2011 DET = AM(K,K)*DET

IF(M.EQ.0.0) DET=DSQRT(VTEMP)*DET

V(K)=L

IF(PSJMAX.LE.PTEST) GC TO 5200

CTEMP = 1.0CC/AM(K,K)

A(I,K)=CTEMP

IF(KPLUS.LT.N) GC TO 2019

DO 2059 J=KPLUS,N

A(I,J) = -CTEMP*CDOT(-AM(K,J),AM(K,1),AM(1,J),KMINUS,NODMST)

2059 CONTINUE

DO 4109 K=1,NMINUS

KPLUS=K+1

DO 4119 I=KPLUS,N

A(I,K) = -AM(I,I)*CDOT((C.0CC,C.0CC),AM(I,K),AM(K,K),I-K,NODMST)

4119 CONTINUE

DO 4209 I=1,N

DO 4219 K=1,N

IF(I.GE.K) GC TO 4212

A(I,K) = CDOT((C.0CC,C.0CC),AM(I,K),AM(K,K),N-K+1,NODMST)

DO 4212 K=1,N

A(I,K) = CDOT(AM(I,K),AM(I,I+1),AM(I+1,K),N-I,NODMST)

4212 CONTINUE

4209 CONTINUE

DO 4309 L=1,N

S=L-L+1

KCOL=10*INT(V(K))

IF(KCOL.EQ.0) GC TO 4309

4309 I=1,N

CTEMP=AV(I,K)

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........1.....2.....3.....4.....5.....6.....7.*.....

```
AV(I,KCCL)=CTEMP
4319 CONTINUE
4329 CONTINUE
      GC TC 6500
5200 IER=1
      RETURN
6000 IF(VCUT.EQ.0.0D0) RETURN
      CCJ=(0.0D0,0.0D0)
      CC=0.0D0
      ICUT=0
      DC 6260 I=1,N
      DC 6250 J=1,N
      DET=AV(I,J)
      AMR=DREAL(DET)
      AVI=DIVAG(DET)
      IF(AMR.EQ.C0.AND.AMI.EQ.CO) GC TC 6260
      IF(AMR.EQ.CO.OR.DABS(AMR).GT.VCUT) GC TC 6250
      AMR=CO
      ICUT=ICUT+1
5250 IF(AMI.EQ.CO.OR.DABS(AMI).GT.VCUT) GC TC 6255
      AVI=CO
      ICUT=ICUT+1
5255 AM(I,J)=DCVPLX(AMR,AMI)
5260 CONTINUE
      RETURN
END
```

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TECT VOLIST MAP NCKREF COSTMT NODECK SOURCE TERX OBJECT FIXED ACTES
OPT(0) LANGLVL(66) NCFIPS FLAG(1) NAME(MAIN) LINECOUNT(85)

.......1.....2.....3.....4.....5.....6.....7.*.....

COMPLEX FUNCTION CCOT*16(Z,A,B,N,ISTEP)
COMPLEX *16 Z,A(1),B(1)

CCOT=Z

IF(N) 4,1,2

2 DO 3 J=1,N

3 CCOT=CCOT+A(1+(J-1)*ISTEP)*B(J)

4 RETURN

END

OUTPUT DESCRIPTION

In this section we give the meaning of the output quantities of all the programs.

When IWCSS=1 the programs write the cross sections of each one of the spheres in the cluster:

SCASEC } Scattering, absorption and total cross section for the
ABSSEC } spheres in the cluster, respectively.
TOTSEC }

QSCAS } Ratio between the scattering, absorption and total
QARSS } cross section, respectively, and the geometrical cross
QTOTS } section of the spheres.

The same quantities are written for the cluster as a whole, so that:

SCASEC } Scattering, absorption and total cross section, respec-
ABSSEC } tively, for the cluster.
TOTSEC }

QSCAS } Ratio between the scattering, absorption and total
QARSS } cross section of the cluster, and the sum of the geo-
QTOTS } metrical cross section of the constituent spheres,
 respectively.

Furthermore the programs write the following informations relative to the cluster as a whole:

SCARAT } Ratio between the cross sections of the cluster and
ABSRAT } the sum of the corresponding cross sections of the
TCTRAT } constituent spheres calculated according to the Mie
 theory.

The last information written by the programs is marked 11 and 21 if IHELP=+1, and 22, 12 if IHELP=-1.

11 is the 11 component of the normalized forward scattering cross section of the cluster, while 21 is the 21 component of

the same quantity. Analogous meaning have the quantities marked 22 and 12.

Furthermore, 11 also marks the quantities

$$\frac{\operatorname{Re} f_{\gamma\gamma} \text{ (cluster)}}{\operatorname{Re} \sum f_{\gamma\gamma} \text{ (spheres)}} \quad \text{and} \quad \frac{\operatorname{Im} f_{\gamma\gamma} \text{ (cluster)}}{\operatorname{Im} \sum f_{\gamma\gamma} \text{ (spheres)}}$$

According to ref. (5) these quantities are related to the macroscopic optical constants of an assembly of clusters with low density.

TABLE I

Number of the elements of the T-matrix (EN) for a cluster of N spheres with a given L_M . The actual memory requirements for this matrix is obtained by multiplying EN by 16. The asterisk marks the entries corresponding to clusters that can be handled by PRG2. All the other entries correspond to clusters that must be handled by PRG3. The maximum capability of PRG3 is a cluster of 70 spheres with $L_M=1$. This requires to handle a T-matrix with 176400 elements. The total memory requirement of the program is of 4 Mbytes.

N	L_M	EN
* 4	3	14.400
*	4	36.864
	5	78.400
	6	147.456
* 5	3	22.500
*	4	57.600
	5	122.500
* 6	2	9.216
*	3	32.400
	4	82.944
	5	122.400
* 7	2	12.544
*	3	44.100
	4	112.896
* 8	2	16.384
*	3	57.600
	4	147.456

$\tau_p = 1.0 \text{ fm}/c \approx 7.7 \text{ fs}$, $R = 0.7 \text{ fm}$, $\rho = 0.3 \text{ fm}^{-3}$

BRITISH POLITICAL ECONOMY

• 100% DRYING; $\Delta E = 7$, $T_{H2O} = 20$, $pH = 2.0$, $L^* = 4$,
• $a^* = 0.7$, $b^* = 0.1$; CURTATE, $R_0 = 1.4$, $N_E = 1.5$, $N_{CURE} = 3$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

• $\mu_0 = 1.0$, $\beta = 0.0$, $P = 0.0$, $LW = 3$
• $\mu_0 = 1.0$, $\beta = 0.0$, $P = 0.0$, $LW = 3$

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THE PENTECOSTALS

Host: localhost, User: root, Database: test

THE PRACTICAL

$\tau = 0.1760000000000000$
 $N = 7, M = 3, P_B = 3.3, L^M = 3$
 $U = 1.0, W = 1.0, V = 1.0, R = 3$

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1.0000000000000000E+00
 1.0000000000000000E+00, R=0.3, T=0.0, P_B=1.0, L^M=3
 1.0000000000000000E+00, CONTATC, N_U=1.0, K_B=1.0, MODE=3

END

FILMED

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